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Entering a post-device era?

When the iPad 2 was launched, Jobs famously spoke of it as a post-PC product, heralding what many believed to be the much hyped “post-PC era”. Many industry analysts and commentators since then have at various points in time, rung the PC’s death knell (often prematurely). Every now and then you’d have reports surfacing based on region-specific usage studies highlighting how PC usage is declining and that smartphones and tablets are fast becoming preferred devices for people to connect to the internet. In developing countries such as India, this doesn’t seem all that surprising because we really have a whole generation of users whose first point of contact with the internet has been the ubiquitous smartphone. However, it’s not just the developing world that is experiencing this shift. There was an Ofcom research study conducted back in Aug 2015 which reported on poll data gathered in the UK. In this report for the first time ever, Tablet + Smartphone usage went past the PC + Laptop usage, making these mobile devices the preferred ways for people to get online in the developed world as well.

As Digit readers, whatever I’ve said so far is probably already known to you. What is new, however, is the cyclical nature of these developments as discovered by Bob O’Donnell in his piece about the same topic (<http://dgit.in/PostPC-Era>). He has observed that the the PC market peaked in the last quarter of 2011 and has steadily declined ever since. Similarly, despite the upbeat sentiment surrounding this device category, tablet sales peaked and began to decline in the fourth quarter of 2013 almost exactly two years after the PC slowdown. The story gets even spookier. There have been reports trickling in of global smartphone shipments declining or at least plateauing this year.

Obviously people aren’t renouncing smartphones, just like no one really renounced PCs since Apple’s 2011 declaration of the post PC era. In fact if you look at the fine print within such polling based reports, you’ll find caveats such as the data only relates to usage outside of work. Well, it’s kinda obvious that outside of the productivity sphere, most people are indeed glued to their small screens rather than full scale PCs.

Let’s do a thought experiment.


Let’s play along with the hype and imagine what this post-smartphone world would look like. Devices have been offloading the heavy lifting on to the cloud for quite some time now. Maybe the smartphone and tablet will morph into something thinner and leaner (in terms of processing power,

if not footprint). Where will this progression end? Until the device disappears entirely and the UI vanishes? This is exactly what Bob O’Donnell wonders about in the piece referenced above: the age of device-less computing driven entirely by voice-based interactions which in turn off load the heavy lifting to cloud based deep learning algorithms. A post-device era, so to say. There will be devices of course in this future but they’ll be dumb devices backed by a very smart and ever evolving cloud brain.

We all saw the Google Home demo reel debuted at the recent Google IO and while it seems promising, I firmly believe the post device is a little far out. Its time just hasn’t hasn’t come yet. For that device-less future to be a viable one, other ancillary technologies need to progress at the same rate and be part of a combined ecosystem that enables device-less computing.

I’m talking about technologies such as seamless eye tracking, locational awareness for devices, and even brain-machine interfacing. It’s one thing to tell your “always listening” voice assistant to play the morning playlist but quite another to say something like “display my Facebook feed on the living room screen” and have it actually mean something. Sure the tech today is at a stage where your feed will be displayed. But what next? How will you scroll without a device? (ans: eye tracking), how will you reply? (ans: a combination of eye-tracking and BMI).

Thankfully, there are real world developments inching us closer to this sci-fi horizon. For example, at an IoT conference recently, I got to listen to a fascinating keynote by Colin Angle, the CEO of iRobot in which he said that Natural language processing has come to a stage where machines can understand complex sentences like “Bring me a beer from the fridge”. They just can’t do anything about it because they don’t yet understand where the fridge is. His little Roomba bots are doing their bit to map people’s houses and at least take care of that bit for when the ecosystem evolves.

When do you think we’ll see a post-device era? Let me know. 



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“Outside of the productivity sphere, most people are indeed glued to their small screens rather than full scale PCs”



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Jayesh Shinde
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"We see one set of people using technology's benefits to shortchange a different set of people"

Living on the fringe of Mumbai, I rely completely on the public transport system to commute from and to work on a daily basis. I take the suburban train, city bus and auto rickshaw to get to work, and my commutes are fairly boring and without incident. On days when we have to stay back in office till the graveyard shift and close the magazine, I take radio cabs like Meru, Ola and Uber to reach home from office. On these long journeys, I try and have a conversation with the cab drivers, understand how technology is helping them adjust to a whole new reality of commuting in a megacity like Mumbai.

Technology was helping them – the customer and the company – all right. In more ways than one. And not all of them good. Let me explain.

Talking to several radio cab service drivers led to a revelation as to how consumers are trying to game the system. Two words: surge pricing – every app-driven cab hailer's worst nightmare. It's a facet of the service that has attracted a lot of consumer ire, but cab services feel it's their right to be compensated a little more when a consumer's assured a cab amidst surging demand. To counter this practice, consumers have come up with a novel solution. While booking a cab they drop their location pin in an area which isn't in the surge price zone. Upon getting a confirmed cab booking, they then proceed to call the driver and tell them that their phone's GPS is wonky and that they're actually located somewhere else altogether. This is really hard on the drivers as they often have to go out of their way and burn extra fuel to pickup locations. Hope no Digit readers engage in this practice.

Now an example where cab service companies are being a little cheeky when it comes to reassuring customers who've just booked a cab. For example, if a customer sees that estimated arrival time of a cab is three minutes on their phone app, the same pickup locations will appear as 15 minutes away on the driver's mobile dashboard. This incongruity

in arrival time estimates is done on purpose to reassure impatient customers and not lose their business.

I know this may not be a big issue, just some people cutting corners and what's the difference between a few minutes here and there. But my primary concern is why engage in this deception?

Remember unsubstantiated reports from a year or two ago claiming how ecommerce and ticketing websites track users' browser cookies to jack up fare or item prices. What do they say about there being no smoke without a fire?

So far, we had spoken about how in certain cases access to technology was negatively affecting people, whether it involved staring too long at digital screens (like smartphone usage in the dark can render you blind for up to 15 minutes - <http://digit.in/PhoneBlind>) or sitting at a desk without too much exercise. Initially, people were mesmerized by technology's appeal and later they knew for better or worse they were stuck with it.

But now, we see one set of people using technology's benefits to shortchange a different set of people. Intentionally screwing over people through technology malpractice is a lose-lose for both the companies and users, in the long term.

Companies need to be careful, as in the digital age any malpractice will not remain under cover for too long, and at stake is the credibility of the so called sharing (/access) economy. More than encouraging people to accept technology, such negative practices will ensure people continue to remain skeptical of technology's advantages. ■

Contents

QUICK NAVIGATOR

001 ENTER

014 DGT
Desire
Greed
Temptation

034 SCI TECH
Tomorrow's Tech
Space Age
From the Labs

067 WORLD VIEW

071 DEVMORX

082 TRIED & TESTED
Comparison Test
Bazaar

101 STREET SMART
Killer Rigs
Top 3
Agent 001

140 ESC
Unwind
Community



44 Back to School

As vacations come to an end and it's time to head back to the classroom, here's a tech guide to conquer the academic year!

We need to talk 26

The next time you feel lonely, you might find that talking to a machine is not such a bad idea after all, be it your smartphone, PC or even your entire home!

TRIED & TESTED



89 **GEFORCE GTX 1080**
Make way for Pascal!



95 **ASUS ROG GL552VW**
Brilliant Budget gamer



97 **ONEPLUS 3**
Gets it right



115 SKOAR! (Now inside Digit)

Dive into the Indian cosplaying scene, plus all the highlights from E3 2016 and much more

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Step 1

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Step 2

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Step 3

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42 Artificial Meat

Your next burger might just come out of a laboratory, and still taste really good!



108 Going mobile with Impress.ly

The super-easy way to make websites on any platform

SWIFT PROGRAMMING TOOLS

digit
DVD

FACEBOOK F8
E3 TRAILERS



98 UE BOOM 2

One of the best around



99 RICOH THETA S

A nice, fun beginning

ON THE DVD

Swift 2

Tools to get started on Swift 2, Apple's programming platform for all devices that was open-sourced at WWDC 2016

Swift Programming

- Silver
- Swift for Linux
- Swift for Windows

Updates

- Ashampoo Backup 2016
- Comodo Antivirus
- Comodo Firewall
- Mailbird
- NVIDIA Graphics Drivers
- Virtual Box
- Waterfox

Free to Play games

- Blind Trust
- The Way of Life
- Transmissions: Elements

E3 2016 Trailers

- Batman: Arkham VR
- Battlefield 1 Image
- Call of Cthulhu
- Days Gone
- Dead Rising 4
- Death Stranding
- Detroit Become Human
- Dishonored 2
- Farpoint
- FIFA 17: The Journey

- Final Fantasy XV
- Forza Horizon 3
- Gears of War 4 Image
- Gran Turismo Sport
- Gravity Rush 2
- Halo Wars 2
- HAWKEN
- Here They Lie
- Horizon Zero Dawn
- Injustice 2
- Inside
- Mafia III Gameplay
- Mass Effect: Andromeda
- Minecraft
- Prey
- ReCore
- Resident Evil 7 Biohazard
- Scalebound
- Sea of Thieves
- Serious Sam VR
- Skylanders Imaginators
- Spider-Man PS4
- State of Decay 2
- Steep
- Styx: Shards of Darkness
- Tekken 7 Image
- The Elder Scrolls: Legends
- The Last Guardian
- The Technomancer

Facebook F8 Conference

Facebook's annual conference for developers and entrepreneurs who create services and products around the website. The keynote is included in the DVD.



Go back to school

As you've no doubt already gathered from the cover of this month's issue, we're focussing on going back to study – as students of schools or colleges all over India head back after their summer vacations this month. However, this column is not about that.

This month we were all wiped out by sickness for over half the month, and this included even me, all the way on the other side of the Indian Ocean. Sickness may make us geeks not want to work, but it doesn't cause our brains to shut down. Thus, while my wife reminds me that I was pretty much a big baby for the better part of 15 days while I was down with the flu, I was also a big baby in another way – like a baby, I decided to be wowed again, and learn, and brush up on some stuff.

It started with gaming first, obviously – every good tech story should start with gaming, as far as I am concerned. First I went back to relive 2004 as I fired up Half-life 2. I also ended up playing Black Mesa (Half-life 1 on the Source engine), all the while yearning for HL3, like every other Gordon Freeman fan out there. Damn you Valve!

Then, however, I also decided to brush up on my almost nonexistent HTML5 and PHP skills, and although I still suck at them, perhaps I'm just a tad better than before. I'm currently trying to figure out how to write CSS. I'm also going to be rooting my OnePlus 2 and trying custom roms and experimenting. The darn home button on my OP2 died, and now I'm not at all bothered about voiding warranty. Why am I doing this? Does everything need a reason? Can't we just learn and try things for the sake of learning or trying them?


So many of you will go (or have gone) through engineering and end up doing MBAs, or being entrepreneurs, or even working in the family business. It's not like everything we learnt in school or college is needed. Sometimes we just want to learn things for fun.

I've been on a (re)learning science journey for the past year, mostly because of writing the dmystify books, but more because I love science, and life and responsibilities just always got in the way of me being able to do so. As if I needed another reason to love my job at Digit – who doesn't want to be paid to do the stuff they actually would have done for free anyway, right?

The point I'm trying to get at is that this might be the time when all the students go "Back to School", however, if like me, you've also long stopped being a student, perhaps it's time to start being one again. Just because you work, or have kids, or have other priorities right now doesn't mean you can't take some time out to do something just for yourself.

Maybe it's a DIY project you want to start, or you want to learn a new skill, learn to read, write or speak a new language, maybe code in a new language, or read up on a whole new subject... whatever the case, there's just no excuse to not learn something new anymore. Thanks to technology, the internet, smartphones and apps, learning pretty much anything is well within reach now. You can even do online courses, or take up after work part time courses, all depending on how much time you have to spare, how much money you're willing to spend and what kind of learning you want to do.

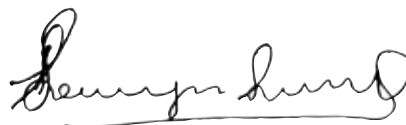
Maybe you just want to go through all our past Fast Tracks and learn some new skills – we've given them away with last month's June anniversary issue. Whatever choice you make, no matter what skill you choose to learn, no matter how arbitrary, technology is here to help.

As someone who's cooking skills never surpassed the ability to make really bad Maggi (now Patanjali?), I also did some YouTube watching to learn how to make idlis and dosas. They turned out pretty OK, and I'm pretty pleased with myself! I'm taking baby steps with a lot of things, and keeping my mind open (like a child), so that I can also start this school year with all the other "kids", by going back to school. I suggest you do the same. Be shameless, have no fear, openly admit that you don't know something, and then go back to school and learn something new, it's tremendous fun, and very satisfying! 



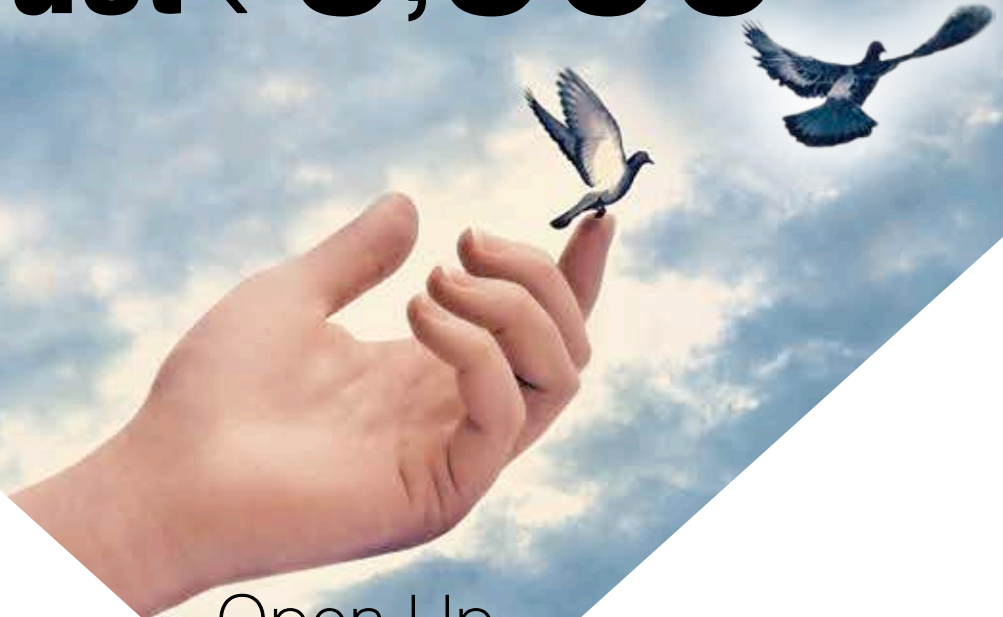
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“Just because you work, or have kids, or have other priorities right now doesn't mean you can't take some time out to do something just for yourself”

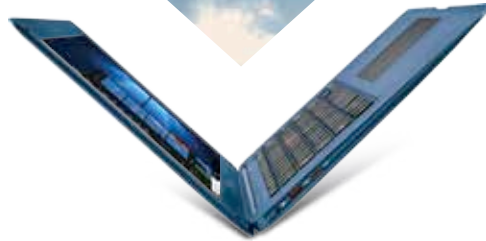


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Gigabyte.....	Back cover
iBall	7,77
SBI Cards	13
QNAP	17
Innov 3D	19
Indian Oil	21
RDP.....	23
India Antivirus	143
Quantum.....	144

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- Circle Gaming CC 830
- HTC 10
- Zebronics Unicorn ZEB - 522B
- LINKSYS N600 Pro Wi-Fi Range Extender
- LeEco Le Max 2
- LG G5
- ASUS ROG GL552VW
- Sony MDR-100 ABN
- Gigabyte GA-X99-SLI
- Sony Xperia X
- OnePlus 3
- UE Boom 2
- LeEco Le 2
- Yu Unicorn
- Ricoh Theta S

GPU Comparison:

- GIGABYTE GTX 980 Ti XTREME Gaming
- GALAX GTX 980 HOF 4GB DDR5
- ZOTAC GTX 970 AMP! Extreme
- XFX R9 380X
- Power Colour R9 380
- XFX R9 285 Black Edition
- Sapphire R7 370 Nitro
- MSI GTX 950 Gaming 2G
- TAG GT 730 4GB DDR

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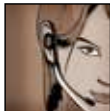
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DGT

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**iPhone 6 banned in China**

China has banned the sale of the iPhone 6 and 6s as they infringe on certain patent rights <http://dgit.in/ip6ban>

☒ Hey Jayesh, I'm sad to have not met you when I came to the Digit office. Siddharth said you were sick, I hope you are all right now. I would like to thank you for letting me visit the Digit office. It was a one of a kind experience for me, and I have you to thank for guiding me. I had lots of fun conveying my thoughts and opinions to the team at Digit. This visit just made me realise the massive effort you guys put into the magazine. Congrats for the 15th anniversary. You guys outdid yourselves with this issue. No wonder you are so popular! Thanks again

–Nishanth

☒ We're popular because of fans like you and we're glad you visited the office. Sorry for not being able to meet you. Come back again whenever you can!

–Jayesh

☒ Hi Adama, The title of your column "15 men & 1 woman" was pretty relevant. The question you asked readers made me think: I have never known a woman (or a girl!) who wakes up to the sound of Tech YouTube videos. Neither have had a long conversation with a woman about the difference between active and passive 3D. Heck, what is active and passive 3D? And yes, who is making the next iPhone's processor? It's nice to know some offices aren't boring. (Come to my mom's office and you will know what I'm talking about.) It's nice to know that adults can still be kids. And with summer holidays ending, I'll be back to school soon with our own Digit inspired gang, discussing the latest games, computers, cars, learning something new in tech everyday. Thanks for reading this.

PS. I don't have a Twitter account. Sorry for any spelling errors.

PPS. If you can reply, could you please tell me what is active and passive 3D?

PPPS. Who is Agent 001? I promise not to leak the identity :-)

–Marvin Nathan, CEO of Stark Industries

☒ Dear Marvin, Thank you for writing in. It's the enthusiasm of readers like you that keeps us going. As requested, here is an article we did on Active 3D vs Passive 3D - <http://dgit.in/ActVPas>

Feedback for the June 2016 issue of Digit



As far as Agent 001 is concerned, his/her identity remains a secret to all of us. Keep writing in.

– Adama, Pepper Pots ;-)

☒ I love Digit to infinity! On a dull day at school I saw many of my classmates huddled over the a table in the library. I asked one of them what was going on and he looked at me with astonishment and asked, "you don't know Digit? It's the best tech magazine in the country!"

After a lot of fight over Digit in the library, I finally got my hands on it and after reading a few pages I was flabbergasted. I am a subscriber since then (Feb 2016). I wait anxiously every month and read it like it's part of my curriculum. I am regularly in touch with Mithun: once I asked him about his phone and he says he communicates telepathically and sometimes uses a Nokia 3310! I love all the articles and especially the posters.

I am going to imitate Robert's style. The Anniversary issue was (I am out of words). One last thing: The DVDs don't work on Mac. Kindly look into this. Keep Rocking!

–Tanishq Khare

☒ I see you've already got a taste of Mithun's humour... he's pretty much like

that with all of us, all of the time. About the Mac, we're not going to beat about the Apple tree – don't hold your breath. We have no plans of making the DVD run on Macs, but we may include a few software for Macs. Sorry, but we really have to balance the effort to reward ratio (too few Mac users) because we have very limited resources and a myriad things to improve.

–Robert

☒ Congrats Team Digit, for your fabulous and amazing 15 years. I started reading the magazine in November 2015 and I have to say, you guys just get better and better everyday! The 15 apps story was brilliant and I downloaded 14 of them (not #11) and it made my life easier as well as adventurous. All of the 15-themed articles were nice and the camera phone comparison helped me the most. Your YouTube channel is more than amazing. Keep working Team Unbeatable, you are my new tech heroes, all of you.

–Ark Aryan

☒ I couldn't quite understand which app you were referring to, because strangely, both app stories had weird apps at #11. Now I know which one. Think about it, people maintain travelogues, create



Google sued by Space Data Corp

Space Data Corp has sued Google for apparently stealing their idea for Project Loon
<http://dgit.in/ggleloon>



Mi Band 2 launched

Xiaomi unveils its third fitness band, the Mi Band 2 that is fancier and tracks your activities just for \$23. <http://dgit.in/XMiBad2>

Inbox

rockumentaries, write daily journals; why not document your excretory prowess as well? A crapalog, a poopumentary, a fecal journal, if you will. Worth thinking about eh?

–Siddharth

☒ Hi Digit Dons! This is my first email to you. I just got my copy and was once again impressed by the sheer amount of content! I liked the 15 related topics and also the Android Studio FastTrack. I know this all might seem familiar to you all, but again, you the demi-gods of tech

I have compliments and complaints.

First, the complaints:

1. You only provide a single DVD now-a-days. I have read that many subscribers want you to do away with them, but many still need them because of our pathetic internet speeds.
2. The ads spoil the reading experience.
3. Provide info about innovations and competitions in tech and science.
4. Include science fiction series
5. Please change the DVD UI.

Some questions:

1. Do any of you hate iPhones? I do.
2. Has anyone tried their hand at hacking?
3. Who are your fav bollywood actors?

At last, the compliments

The mag is my source of tech and programming info. I miss gaming (particularly CS:GO) because my PC can't run games properly, but I am looking to buy a new laptop, and I will ask Agent001 about that. Never stop the mag! DIGITise INDIA!

–Saksham Sneb

☒ Valid complaints and suggestions Saksham. About the DVD, like you said yourself, people with limited connectivity are fast becoming a minority, and even laptops exclude optical drives these days. We think one DVD should satisfy most of our readers, and we try to make that DVD as awesome as we can. Abhijit (the DVD guy) is hard at work on the interface. About ads, unfortunately there is a market-wide belief which makes advertisers seek pages at the very beginning of the magazine, which is why you'll find most of the ads bunched up in the first half of the mag.

While none of us "hate" the iPhone some of us do dislike the iOS UI. If we've done any hacking rest assured it's always

been the "white hat" kind. Favourite Bollywood stars? I guess we all like Chitrangada Singh... "she's easy on the eyes" is the unanimous Team Digit opinion. Cheers!

–Siddharth

☒ I'm writing this letter to let you know that I've completed 5 years of being a Digit reader. Cheers! I want to appreciate Digit's delivery team: I receive my mag mostly in the first week of the month. But this time I got it before the month of June even started! Some pages were missing from the SKOAR mag, so I dropped a mail for replacement. Guess what? I've received the entire package again!. I've decided to give it to my school's library so that those kids can get some inspiration.

I love how each and every member of Team Digit is always ready to help us readers. I remember Robert and Siddharth helping me out with my Resume back in 2014. A more recent SOS session saw Robert answer all my queries regarding the industry (I'm a Blogger, thanks to Digit) and helping me take a decision about a job offer I had. All this at around 1.15 am Australian time. Who does that? Only the folks at Digit.

In these last 5 years, I've learnt a lot from Digit. Yes, the website isn't great And the DVD UI is ancient, but, I feel it's all about the quality of content that's being served. It's because of Digit that I got special respect from the professors and lecturers in the college, because I was aware of the current trends in tech. Same applies to job interviews. I have only given two job interviews till now and was selected in both of them. The moment I said I read Digit, the Founders were like 'Oh you read Digit?' (picture the "not bad" Obama meme). And then, the interviews were super easy for me.

Finally, I would like to say "It's good to have Big Bytes of The RSS Feed on The Static Page". These columns are something I read first followed by Digit Diary.

–Sagar Bakre

☒ Happy Belated Birthday Sagar! It's always a pleasure to hear from you :-)

Great of you to share your extra copy with your library! Here's to 5 more years of being with Digit. Cheers!

–Siddharth

☒ I have been an avid Digit reader since ages. I am 17 and consider myself a tech enthusiast. I feel that the review quality of flagship smartphones in digit magazine has badly deteriorated since the last few years. Most reviews follow the same pattern – start with a bold headline, expand the specs in essay form (and consequently tell us things we already are aware of), and make needless comparisons to other products (Eg. A is better than B because B is worse than A?). I remember that once in Moto X review you guys barely wrote two lines about its most amazing features like *touchless control and active notifications*. You also often ignore audio quality (headset and speaker), exclusive features like the ones in Moto X and most importantly, after sales support for the product. I know that your reviews need to be compact, but we wait for your magazine for 1 MONTH, make it worthwhile please.

–Ayush

☒ I totally understand your sentiments, and I have to (grudgingly) agree with you. Grudgingly, because it is I who is to blame.

We have a few processes at Digit:

1. We have very rigorous and meticulous test methodology, and HAVE to review all phones in exactly the same manner in order to remove subjectivity and bias.
2. Our site reviews follow a template, by design, because they are written with a lot of things in mind – SEO, ease of reading, ease of comparing phones, etc., based on studies we have done to find out how people read online.
3. Site reviews are slightly dumbed-down, because they target a different audience (site visitors aren't enthusiasts like you).
4. These site reviews are then cut short later for the magazine and fitted into a much smaller space.

You are very right to point out that as a result of this process, you are getting a magazine review that is essentially not written with an enthusiast like you in mind.

I promise to look into this seriously, and try and find a way to balance workloads, yet give you a more unique review, written specifically with enthusiasts like you in mind. We really appreciate candid feedback, because it is the only way we improve.

–Robert

Droom to expand

Droom - Indian used car selling platform startup plans to expand to Southeast Asian markets after it received Series B funding. <http://dgit.in/DrumExp>



Redesigned VSCO

VSCO, the popular image editing app gets a completely new app interface on iOS as well as on Android. <http://dgit.in/VscoRD>

LETTER OF THE MONTH

Dear Sir, I am a scientist at Regional Remote Sensing Centre - West, a unit of Indian Space Research Organization (ISRO) in Rajasthan. I am an ardent reader of Digit ever since my college days and have ensured that our office library has a regular supply of Digit over the past decade.

Our centre conducts summer training for students of local Engineering colleges every year. This year we have received a fair number of students from Electronics related branches and I have thought of a project (being taken up by multiple groups) that entails the use of Arduino.

I even created a forum for discussing the projects and it can be seen at: <http://rrscw.nrsc.gov.in/TrainingForum>

Unsurprisingly, I found that the best introduction to Arduino has been in the FastTrack to Arduino For Everyone published by Digit as FastTrack Volume 09, Issue 12 (December 2014). I have a hard copy of the issue on my desk right now and would love to share it with my students. I was delighted to note that the DVD with the June 2016 issue of Digit had digital copies of the FastTrack, but was disappointed to note that it was just for the past 15 months and I missed the

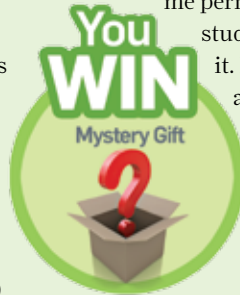
issue that I needed. I even purchased a digital copy of it on readwhere.com but was again disappointed that I could not download it as an offline file.

Therefore, I would like to request you to send me a digital copy of the aforementioned FastTrack and grant me permission to share it with my students so that they benefit from it. I promise to make sure that it is acknowledged on the forum as well as in the reports that make use of the book.

Looking forward to a quick and positive response.

Yours sincerely,

–Gaurav Kumar



Dear Gaurav, You just made our day - in more ways than one: (1) a letter of appreciation from someone as qualified as you, (2) the fact that Digit content is being used in the service of the Nation, and (3) Digit content will be used in training the future scientists of our country. Thank you so much for your patronage of Digit. We'll be sending you the the desired FastTrack content. Please free to share it with your students. ISRO is one of India's finest institutions. As a fellow citizen, I thank you for your contribution towards making that happen.

–Vikas Gupta

Hey Digit team! June is my birthday month, but more than that I am excited about your anniversary edition. Every year I plan that I will 'unwrap' the magazine on my birthday, that is on 9th June, but I just can't resist it, and open it on the very day I receive it.

So let's come to this month's issue. I yelled, wow!! The magazine, Fast Track, DVDs! I am not into gaming, so I don't enjoy SKOAR!, But I do like Gangsta Granny. Last year you sent a poster with geeky quotes, that adorned my room's wall for a year. This year I expected a similar one, but it's OK, I will keep the old one up. The dmystify has made me develop a love for the Universe, and your DVD's are a real treasure.

It's a treat to read the articles by editors at the starting. Seriously, your write ups spark a debate in my mind! Siddharth, you are really handsome! ;-) I became your fan the day you wrote that you find building your own PC quite meditative. That was soooo cool!! Jayesh, you always set that nostalgic feeling and make me have a trip of the past and I just imagine how the past has been from your article. I was surprised to see Adama's column. Finally a girl!! Yippee! I always wondered how it felt to work in an all boys' team, and your article answers that greatly. As I am developer, I enjoy the devworx articles, and the PHP 7 article was really informative this time.

This year I passed out from college. I did engineering in Computer Science, and

I must thank you guys for pouring loads of information from the tech field into my head. You helped me be the geek I always wanted to be.

I used to have to ask my dad to buy me a Digit subscription, but now I will be working soon and will finally be able to afford it myself. I applied for a big data job without knowing a thing about it. Your Fast Track on Big Data saved me. The Fast Tracks help me a lot. I remember how confused I was before starting my blog, again the Fast Track came to the rescue!

I do not find your website to be very good, however. You have been doing such a great job that expectations shoot up. Once I wanted to post a question, I wrote it out and then it asked me to login. After logging in, the page got reloaded and the whole question was gone :(Another question I posted after that went for moderation but has never been posted since then.

I am eagerly waiting for your e-mag, so that I can read Digit wherever I am. I keep relocating, so I need to get Digit posted to my home address, and have to wait 3-4 months to read them when I come back home. Accessing your mag on phone will make things a lot easier for me. I even applied for the beta version test.

I could go on, but I will stop now or else you will delete my mail straight away for wasting too much of your time. All the best and keep up doing your good work!

–Amita Shukla

Thank you for your email. We are finalising the new emag based on suggestions and feedback from many readers who took part in the beta launch. It shouldn't be long now, maybe in a month we will launch the final version. We will let you know as soon as we do, and we hope you will help us publicise it by asking your friends to download it as well. About the website, do you mean you were trying to log into the forum and weren't able to? Can you share the page URL with me to check and try and replicate the bug you faced?

And don't worry, "handsome" Siddharth will also reply to you once he gets free from closing the July issue. The whole team is down with the flu (and dengue), so we have been really bad at replying this month.

–Robert

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GREED

For those who just want more than should be humanly allowed, we have enough to satisfy your hunger...

THIS MONTH: ASAP Connect, UMi Super, ModMic 4.0, KENT Aura, Rolls Royce 103EX and a lot more...

TEMPTATION

If you're wondering what to do with yourself or how to spend some time getting cultured, this section is for you...

THIS MONTH: Movie Review: X-Men Apocalypse, App Watch: Timeout, Mypoolin, Yumchek

DESIRE > SHOWCASE

AMD Radeon RX480

A power packed mid range performer



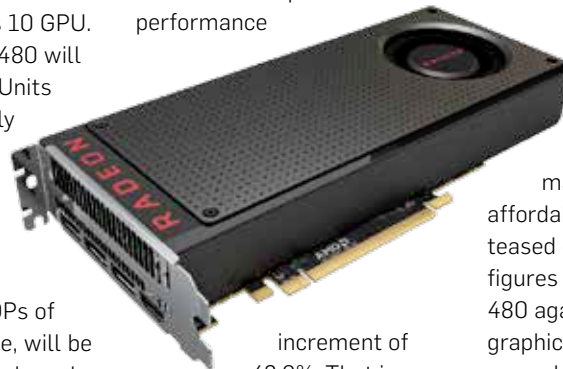
ASUS Zenbo

At Computex this year, ASUS stole the show when they unveiled Zenbo, a robot assistant with no mention about its specifications. It can be controlled by voice and has camera sensors to detect its surroundings. We can only speculate that Zenbo is running on Android for software on top of Intel hardware. This is for now the closest we've got to building R2D2 commercially.

Polaris marks AMD's fourth iteration of GCN (Graphics Core Next) and could very well be based off the rumoured Polaris 10 GPU. The AMD Radeon RX480 will feature 36 Compute Units (CUs), so cumulatively that makes it 2304 streaming processors. AMD has said that the RX 480 is capable of more than 5 TeraFLOPs of compute performance, will be available in two SKUs based on memory capacity (4/8 GB) which in turn has a bus width of 256-bit.

A price tag of \$199, makes the RX480 a direct successor to the AMD R9 380. So going by the TFLOPS

that both cards are capable of i.e. 3.5 TFLOPs and 5 TFLOPs, we see that the RX 480 has a compute performance



increment of 42.9%. That is a tremendous generational increment.

The not so surprising change is the reduction in TDP for the card to 150W, which can be attributed to the 14nm FinFET manufacturing

process. The main aim of these power-efficient GPUs happens to be democratising VR. AMD mentioned explicitly

how getting a VR-ready PC costs and the RX 480 is meant to change that scenario and make VR all the more affordable. In fact, AMD has teased certain benchmark figures which pit the RX 480 against higher-end graphics cards which cost around \$500. AMD notes that bringing down the PC cost considerably (we're looking at a reduction of more than \$300 here) is paramount towards attaining this objective of making VR more widespread. We sure hope so!

Liva Core Z



Based on the new Intel Pentium and Celeron processors, the

Core Z is the next in the line-up from ECS's Core series, directed towards normal PC use-cases.

BRIX Gaming



UHD

Gigabyte's BRIX lineup saw new

devices on display, one of them called the Gaming UHD, sporting a neat aluminium design and packing both i5 and i7 variants in barebones.

AsRock DeskMini



Following up to the new mini-STX standard of motherboards,

the Desktop Mini is a powerful mini-PC capable of housing the latest Skylake processor and DDR4 memory modules.

Liva Core Pro



ECS has also showcased their iteration of a mini-STX based mini-PC

and they are calling it the Core Pro. Directed towards the DIY community, they are open to creative enclosures.

ASUS ROG XG Station 2

If you're crying over the poor graphics performance on your laptop, either you need to buy a new one or you could invest on an external graphics card box. Plugging this device into your laptop won't be universal since some have their own proprietary connector or require a Thunderbolt 3 port (not all laptops have Thunderbolt 3 support). Recently, they have been getting a lot of attention with Alienware releasing the first graphics dock back in 2015. The XG Station 2 carries the design aesthetics from the ROG line and looks far better than what others have to offer. It connects to your laptop using a Thunderbolt 3 port while there's another port available to daisy chain more Thunderbolt 3 devices. It's compatible with certain ASUS laptops while other devices will require a BIOS update. Powered by a 680W power supply, you will be able to install graphics cards from both NVIDIA GTX or AMD Radeon cards. If you happen to install one of the fancy looking cards, the box has a transparent window to show it off to your friends, but owning the XG Station 2 itself will be enough to brag your heart out.



MSI Backpack VR PC

The hype for VR is real. In fact, Computex mostly deviated towards VR devices and games. There's still one caveat with VR, for all the headsets including the Oculus and HTC Vive – the long wires dangling and getting in your way while you move around. We aren't considering the mobile VR headsets since they are far from the experience offered by active VR headsets mentioned above. It's a long way to go to develop systems

capable of handling the huge exchange of data generated in VR and hence packing a VR capable system inside a backpack seems to be the step many manufacturers have taken.



Simply called the Backpack VR PC, it is designed to run the most demanding VR games with an i7 6th Gen Skylake processor and a desktop grade GTX 980. MSI said that users

will be able to game straight for 90 minutes and if this isn't the capacity they are looking for, the battery can be replaced. The backpack weighs in at around 5kg which isn't actually heavy since few high-end gaming laptops are close to this weight. You might be wondering why MSI has used a GTX 980 and the company has addressed this issue, announcing that they plan to upgrade to the newer GTX 1080 line.



Cooler Master MasterWatt Maker

After teasing us for some time, Cooler Master has revealed their top of the line MasterWatt Maker PSU that brags 94% Titanium efficiency. The sweet efficiency of 94 can be achieved at 50% load while still getting 90% efficiency on full load. It has been planned for two capacities of 1200W and 1500W. It also features their digital platform Cooler Master Connect available as apps on Android, iOS and Windows. These apps will let the users control and monitor parameters such as power drawn and voltage with a bluetooth connection to the PSU, and lets you switch between profiles like silent, gaming, overclocking and custom. The aluminium body houses their own Silencio FP 135mm fans and is supposed to be very silent. The fans will adjust its speed according to the load or mode enabled. with support for custom settings. The MasterWatt Maker is modular with a new connector design enabling higher current.

Tt eSPORTS Ventus Z

Any degree of customisation on gaming mice is a welcome feature. But the more customisable they are, the costlier they get. The Ventus Z mouse from the Tt eSPORTS line of products is a newly launched ergonomic mouse from Thermaltake. It features the familiar honeycomb grilled design seen on their other mice from the Level 10 M series. The purpose of the grill is to maintain ventilation beneath the mouse to prevent sweaty palms during intense gaming sessions. The material used for the



body is neither a complete matte finish nor a plastic finish, and does give you a premium feel while holding the mouse. The Avago ADNS 9500 laser sensor will be capable of pulling 16,000 dpi in

the overdrive mode through software and the Omron switches used have a 20 million cycle. Both these components will ensure that the mouse offers you accuracy and a long life. Directed towards right-handed gamers, it beautifully fits for a palm grip with your fingers easily reaching the necessary buttons. It comes with 10 programmable buttons and using the software, you'll be able to save up to five profiles. The 32-bit ARM controller along with 256KB of memory enables you to save these profiles which also includes various RGB lighting modes.



Zotac Magnus EN980

It was evident from Computex that PC component manufacturers are pushing devices to support VR in full form. But Zotac has gone further by turning a mini-PC into a VR rendering machine, claiming to be the most powerful mini-PC. We've seen other manufacturers pack the latest Skylake processors in their mini-PCs but hardly anyone else has tried to install a GTX 980 inside one. The device was announced long back and we got to spend some time with it. It features a special cooling system inside that has a radiator at the center along with a fan that keeps both the CPU and GPU unit cool. If it wasn't for the cooling system, the device would have half the height. The Magnus EN980 needs a lot of power hence it has two external 180W power supplies.

ASUS ROG GX800

At the Computex show floor, the search was on for the most powerful device in every category. And when we entered ASUS' ROG booth, we knew we were looking at the most powerful gaming laptop at the event. On close inspection, we learned that it was in fact the most powerful gaming laptop in the world. Already popular with the title of being the world's first liquid cooled laptop, the GX700's successor carries the same legacy and now it houses the most powerful desktop grade GPU ever made. It has a crazy 18.4-inch 4k screen supporting NVIDIA's G-Sync technology. The water-cooling dock is mainly directed towards overclockers



interested in amping up their unlocked Intel processor and twin GTX 980 GPUs in SLI. We're pretty sure that they'll be upgrading to a newer GTX

1080 GPUs to push the performance further, making it more powerful. The GX800 features a mechanical keyboard as well with the company's own switches called the MechTAG (Mechanical Tactile Advanced Gaming) switches with anti-ghosting technology which are obviously RGB LED backlighting enabled. The laptop is set for launch by

August with no mention of the price, yet but we're quite sure it could win another title of being the world's most expensive gaming laptop.

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Wooting One

Most of the products on the Computex show floor were the regular expected ones and only the good looking ones caught our eye. It was completely coincidental to come across a couple of guys who were working on a disruptive crowdfunded project who achieved their funding goal in just seven hours! The Wooting One is an analog optical keyboard that wants to change the way we play games. On first look, it appears as a regular mechanical keyboard and it's beneath the replaceable keycaps where the analog optical switches are housed. The current keyboards either register a tap or don't but these switches will actually measure



how far do you press the key and register an equivalent function. This is measured using a light sensor by the change in light as you press the key, sending the defined function. So, you would be able to walk by slowly pressing the key while further pressing the key will let you run. The keyboard doesn't really require anything extra to work on your PC, since the keyboard's firmware will register it as a controller on your system. Another sweet feature added is that the keyboard can be toggled between analog and digital mode on the fly. It will be available in Flaretech mechanical switch options which are quite close to how the Cherry MX switches feel.



Corsair Lapdog

Not everyone enjoys playing games while sitting on their chair with a hunched back. There must be many who would prefer a relaxed and laid back option of gaming on their couch and the Lapdog is exactly looking for such gamers. Mini-PCs have served as great devices to stream content in the living room but they don't do much for gaming.

Although there are compact versions of gaming PCs coming out, in this case the Corsair Bulldog, they still lack the feel of proper gaming peripherals. The Lapdog is a barebone shell that lets you install a keyboard in the area and has a mousepad on the right. The mouspad area, at 11" x 11", is quite spacious to say the least, and so is the keyboard space.

It doesn't ship with any peripheral and is only compatible with the Corsair K70 and K65 keyboards. It connects to your PC using a USB 3.1 cable and also requires power plug. The power hub on the device connects your keyboard, mouse, headset or other USB accessories, and these ports also support fast-charging for your smartphone or tablet.

So that you can have long hours of a comfortable experience on your lap, it is lined with memory foam pad on the bottom. The Lapdog is currently available for a price of \$119.99 or around ₹8k. Secret bonus - it has a hidden compartment for neatly storing away cables. No more cable management worries! So couch gamers, time to rejoice!



Thermaltake Core P3

A quick walk across the Computex show floor made it clear that the Core P5 open air case from Thermaltake was the most popular chassis because you would come across one at almost every booth (except at their competitor's booth obviously). The company has now shrunk the P5 into the P3 and there are a few important changes in this one. The P5 was huge and it required custom cooling kits to be able to reach the components but on the P3, you'll be able to install AIO cooling units (up to 360mm). Earlier, it was possible to install a 480mm radiator and now you'll be able to install a radiator with a maximum length of 420mm. The last big change in the P3 is a hidden storage device tray at the back panel.

ASUS ROG Project Avalon

Being an enthusiast in building gaming rigs, you're expected to always have the latest hardware on your systems. Upgradability is limited since motherboards and other PC components aren't modular yet. ASUS has been working on Project Avalon to bridge this gap and once implemented, it will highly affect the gaming industry. The company has built its own modular motherboard housing only the main components such as the CPU, RAM and M.2 devices. This expands the possibility of swapping out components when they turn obsolete or if you want to upgrade. A few basic modules are available now such as daughterboards for storage devices, I/O ports, main power from the PSU and the PCIe slots. So if you want to upgrade the back I/O ports to say a new USB standard, you can simply swap it out with the new one. A sigh of relief for rig builders will be of not having to deal with cable management since components directly latch onto the boards.

Currently, the board supports the X99 platform which means only the 2011-3 socket CPUs are supported. It has a unique main board design hence all the modularity is dependent on the expansion modules manufactured by ASUS. This makes it impossible to install a standard motherboard size (micro-ATX or mini-ATX).



In the design displayed, only one graphics card was supported while the other side was used for a liquid cooling radiator. All the limitations aside, Project Avalon is still undergoing changes with feedback from enthusiasts and we hope the final product turns out to be a gold standard for modular gaming rigs.



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TAKE MY MONEY!

Here is where we keep an eye on crowd funded projects that will make you go 'Shut up and take my money!'



I.dime

Dime size storage, guys! The i.dime magnetic storage expansion is a nifty little gadget which expands your iPhone's storage. It comes with a lightning or micro-USB dongle, and a small, magnetic, dime sized disc. It also comes with a i.dime case, where you can connect the the magnetic disc onto the iPhone cover, and you're good to go.

I.dime can be used across multiple devices. You can use it on your phone, and take pictures or videos, and save it on i.dime, and then detach the disc, connect the dongle to a computer, iPad or another phone, and attach the i.dime to that, and all your files are good to go, on that device. The i.dime comes with a storage capacity of upto 256 GB, and has a read speed of 95 MB/s.

ASAP Connect

If you own any phone, and haven't been frustrated while trying to figure out the right way to plug the charging cable into it, congratulations, you're an alien! The ASAP connect cable is a magnetic replacement to your everyday USB connectors. It has a gold plated micro-USB connector (for Android devices) and Alpha cable (for Apple devices). You plug the adaptor into your phone, and to charge it, you just connect the USB.

The cable uses strong Neodymium magnets to connect to the adaptor. Unlike other magnetic chargers, you don't need to align it perfectly with the adaptor for it to snap onto it. This magnetic connector works the same, even if you flip it 180 degrees.

It comes with an 18K gold connector, and a 1.2 metre long nylon braided cable. It is compatible with almost all phone cases, except ones which have a micro-USB port cover. The project has multiple backing tiers starting from the \$5 discount tier upto the \$1050 Corporate tier.

The project has raised more than \$200,000 on IndieGogo, and will start shipping globally in October 2016.



Vitrima 3D

What do you do when you have used your GoPro in all possible ways you can think of? You go 3D! Vitrima is a 3D lens for your GoPro camera. What it does is, it records two slightly different perspectives, much like how the human eyes do, and integrates it into one video. You can then use any 3D viewer to view the video in 3D. The Vitrima lens comes attached to a GoPro camera housing

It has a focusing range of 2 feet, and is IP67 certified water resistant. It's made of light ABS plastic, and aluminium. You just have to put your phone into a 3D viewer, and you're good to go. The project has raised more than \$40,000, and is shipping worldwide.

GREED

MOBILE WATCH

Stylish, glamorous and interesting smartphones are always on the horizon. We take a closer look at what's hot in this space...



UMi Super 'Super' specs in a budget

UMi, the infamous Chinese smartphone maker has added another 'super' smartphone to its lineup, the UMi Super. This phone sports a 5.5-inch IPS Full HD display that has been sourced from Sharp and is able to deliver 95% NTSC colour gamut. In terms of looks, the UMi Super sports a metal-clad design along with a fingerprint sensor on the back that can register up to five fingerprints and a shortcut key on the left that can be assigned to launch apps. With a 13MP Panasonic

manufactured rear camera, the phone is powered by a MediaTek Helio P10 octa-core SoC clocked at 2GHz with a dual-core Mali-T860 MP2 GPU. The UMi Super comes with 4GB LPDDR3 RAM along with 32GB of eMMC inbuilt storage with microSD card support up to 256GB on its hybrid sim card slot. The phone runs on stock Android 6.0 and has a huge 4000mAh battery. With its UMi Super Quick Charging PE+ technology, five minutes of charging can give 2 hours of talktime and a full charge takes two hours, through its UBC Type C connector. With all of these high-end features, the phone is priced at \$229.99 (approx 15,750) and ships internationally via partners.

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GREED

EXAMINED

Some very cool products come to the Digit Test Centre which don't really fit into the standard product categories that we review in the Bazaar section. We write about them here mostly to make you turn green with envy.



USB and Y audio adapters

It ships with a 3.5mm to USB adapter and will serve you great if the audio ports are already occupied by your speakers. The audio Y adapter is meant for gaming consoles but it will also let you use the mic with your smartphone for amazing call quality.



Easy to carry

The hard shell pouch allows you to carry the mic along with the accessories including the two base clasps (including an extra 3M clasp), alcohol wipes and several cable clips to ensure cable management.



Long and thick cable

The mic has a generous 3.3m cable length and 2.5mm in diameter hence it feels more premium. The boom pole for the mic is 175mm long which is enough to catch your voice.

ModMic 4.0

A much needed accessory for gamers

Before you break your next headphone in the middle of a heated multiplayer battle because of your teammates constantly complaining about your mic, consider going for the ModMic 4.0. For those who already own a good pair of headphones without mics, the Modmic 4.0 is a detachable mic available in two variants – omni-directional and uni-directional. We received both the variants and in no time, it was subject to several hours, or rather several rounds of competitive online matches. Using the magnetic base clasp, it can be easily installed on any type of over-the-ear or on-ear headphone. The boom pole is quite flexible but yet sturdy. In terms of quality, we used both the mics for voiceovers and it turns out that in a controlled environment, the omni-directional records better audio than the uni-directional one. Currently it is priced at \$54.99 (~₹3800) for Mute and \$49.99 (~₹3400) for Muteless, both for omni-directional and uni-directional variants.



The 3M base can be attached to any surface including metal, plastic and even mesh earcups in open grill headphones.

The magnetic clasp is strong enough to hold the mic and the zigzag design lets you rotate the mic upwards when not in use.

The windscreen ensures that your breathing isn't caught by the mic.

KENT Aura

An affordable air purifier

Lately a lot of air purifiers have been entering the market and we've been receiving several of them. Although it's difficult to recreate a room with a controlled amount of particulate matter at our labs, the Aura air purifier had a handy tool. It displayed the parts per million count of particulate matter in the room. Like regular purifiers, the Aura has a HEPA filter that intercepts particulate matter from the air, and additionally, this filter apparently has an anti-bacterial coating. Another normal feature, the carbon filter inside will be able to take out bad odour from the room and cigarette smoke as well.

The device isn't huge, standing at about 500mm in height, it can take up a quiet corner of your room or office. It has a control panel on the top for various controls such as changing modes, setting fan speeds, and also houses an indicator alarm when it's time to change the filter. Along with the particulate matter meter shipped along with the purifier, the device has an in-built air quality monitor. Based on the quality displayed, you can either turn up or turn down the purification speed. The Aura is available and can be purchased for under ₹16,000.



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GREED

DROOL MAAL

Get your drool on and behold some of the fanciest, ostentatious and drop dead gorgeous things money can buy. Droolworthy?



Sirin Solarin

Here's a phone that's worth your entire college fees! The Sirin Solarin launched in May 2016, pegged at a whopping \$14,000 (₹9.5lakhs). The phone boasts of military grade security features, and a physical switch on the phone which toggles a super secure mode for encrypted calls. It also boasts to have military grade hardware level encryption. The company claims that the Solarin has more than 2500 components. At launch, the phone is available in five variants namely; Fire Black Carbon Leather with Titanium,

Fire Black Carbon Leather with Diamond-like Carbon, Fire Black Carbon Leather with Yellow Gold, and Crystal White Carbon Leather with Diamond-like Carbon. Talk about sounding futuristic!

The Solarin looks impressive, and comes with a 5.5 inch 2K corning gorilla glas 4 display. It's got a Snapdragon 810, under the hood. It also comes with a 23.8 megapixel camera with laser assisted autofocus and an 8 megapixel front camera, although we are quite sure the users will have more important things to worry about than selfies. It has a 4040 mAh battery, which supports super fast charging. The phone runs a heavily modded version of Android 5.1, which is optimised for security.

Rolls Royce 103EX

The Rolls Royce 103EX is Rolls Royce giving you a glimpse of the future with the brand's grandeur undiminished. As it is, with Rolls Royce, the 103EX oozes with opulence. It is a zero emission, fully independent, driverless car.

Rolls Royce calls the car a "she", and not without good reason. The Spirit of Ecstasy is actually called "Eleanor", and she also doubles up as the AI of the car. Eleanor can, like any good AI, learn your routine, and adapt to it, even suggesting restaurants, and reminding you of jobs to be done. She can learn your favourite restaurants, your daily routes, and even your taste in art, according to Rolls Royce.

Rolls Royce, being one of the most luxurious car designers in the world, has arguably surpassed their own standards. The interiors are made with some of the most luxurious materials in the world. The body is completely handmade, and the interiors are upholstered with



various varieties of super luxurious silks. Oh, did we say that the 103EX comes without a steering wheel? In place of one, the front section of the cabin comes mounted with a OLED screen. It comes with a 250Kw drive train, and shows that electric vehicles are truly the future of the automobile industry.

The transparent roof provides as much driving pleasure as Rolls Royce could cram in the car. Rolls Royce has truly outdone itself by announcing that the body of the car is completely customizable, adding a whole new level of personalization, in the Vision Next 100 series.

TEMPTATION

CRITIQUE

In this section, we put stuff through the grinder and closely examine what comes out; everything except gadgets, because there's more to life than just that

MOVIE REVIEW

X-Men: Apocalypse

Some inter-studio collaboration, please?



After the last superhero outing being the highly entertaining Civil War, don't blame me if I found Bryan Singer's latest dive into the previous generation of X-Men a tad bit disappointing. To begin with, Days of the Future Past had set our expectations high from this one, but when it finally arrived it contained too much chaos and a villain too stereotypic for my taste.

Don't get me wrong, there were some brilliant performances in the movie. Oscar Isaac holds strong amid all the VFX madness. Unfortunately, the Apocalypse of the comics was a much more interesting villain and this one is ultimately reduced to a parasite.

Yes, Quicksilver did steal the show again in a beautifully shot slo-mo scene where he saves the day, yet again. If only the same amount of attention was paid to giving power performers like Jennifer Lawrence are given very little screen time. Structurally, the first half at least has some buildup and appreciable nods to the stories of X-men comic books, but the second half quickly descends into a mess of chaotic special effects relying too heavily on the popularity of the characters to drive the story forward. Everyone was expecting the awesome Phoenix scene! Quite average, definitely not "Marvel"lous.

Rating: ★★☆☆☆

— Arnab Mukherjee

APP WATCH

Timeout



If you spend a lot of time on your smartphones (literally everyone who owns one), and want to change that, Timeout is here for you. Once installed, it lists down all the apps from your phone and a toggle button lets you assign time limits for every app. The limit applies right when you start the app and once the time runs out, a pop-up appears where you could either continue using the app or close it down. A more effective way would

have been to completely close the app rather than asking. It also gives you a helpful analysis of the time you spend on apps so you can assign the time limit accordingly.

App Store: <http://dgit.in/TimeoutiOS>

Play Store: <http://dgit.in/TimeoutAnd>

Mypoolin



Splitting bills is something you can lose friends over. So it's good to have an app that takes care of it in an efficient way, and that's what Mypoolin wants to do. You can directly select from events around you or create a new one and split its bills by adding friends from your email list. Its partnerships with leading payment providers like Paytm and Mobikwik along with the facility to receive the payment as vouchers and prepaid cards along with bank transfers make it a very useful app to keep on your phone.

App Store: <http://dgit.in/MypoolinApp>

Play Store: <http://dgit.in/Mypoolin>

Yumchek



There are several apps in the food industry trying to bring in their ideas to enhance a wide array of needs. Picking a restaurant for a quick snack nearby or maybe a full meal can be quite a task, and sometimes, the price or the distance aren't the only deciding factors. Apart from only listing down most of the eateries with all their details, Yumchek packs in the Dynamic Pricing Engine. It enables the users to get offers with partnered restaurants

based on the number of people, favourite cuisine and more factors. You'll also be able to earn Yummies by uploading bills and participate in their lottery.

App Store: <http://dgit.in/YumchekiOS>

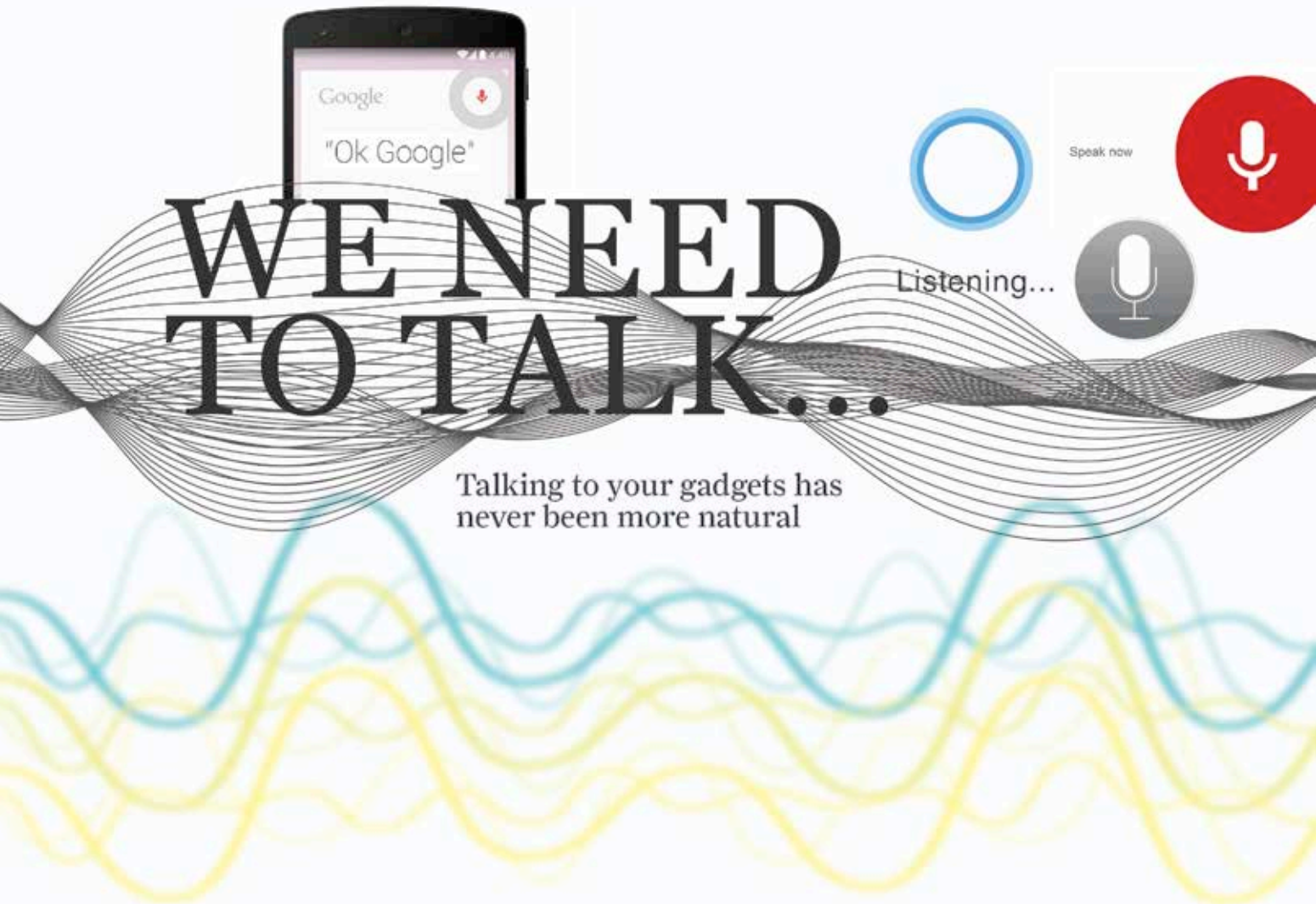
Play Store: <http://dgit.in/YumchekAnd>

Feature

Can you really have a home that can not only take care of itself, but you too? Our take on home automation.

Origins

From Babylonians to today's cryptographers, we delve deeper into the origins of algorithms.



WE NEED TO TALK...

Talking to your gadgets has never been more natural

Arnab Mukherjee
arnab@digit.in

There was a time when talking to a machine in public might have resulted in you being declared insane and taken to an asylum. From that point in time, we have reached somewhere where it is totally acceptable to have long conversations with a witty virtual assistant on your phone while completely ignoring the people around you. Almost every major software platform now has voice recognition in one form or another, be it virtual assistants or mere dictation. We have achieved a lot on how we speak to our smart gadgets now. But are we really there yet?

We're talking more. But Why?

Before we really delve into the quality of digital assistants and voice recognition on

different platforms, we need to stop and take stock of what really facilitates the current state of this technology. At a broad overview level, everything from better audio formats to higher quality microphones have helped in making digital voice interaction a valid and acceptable option. But the technology wasn't really waiting for those parts.

When it comes to the hardware side, the growth of voice assistants on phones as a platform is quite predictable, considering that we have always been looking for ways to replace the hard to use phone keyboards, trying everything from larger screens to new ways for typing. Now, for voice recognition to truly evolve on phones, there was a need for processing power. Google started with the voice search app, with the concept of offloading most of the processing to it's servers. Gradually, smartphone processors gained power exponentially and now we have phones that can take care of the pro-

cessing locally as well, especially for basic, repetitive tasks.

Although hardware improvements have been crucial, the improvements on the software side have been way more significant. The field of artificial intelligence has grown in leaps and bounds in recent years. Rather than exactly catching the sound and transcribing it, modern day virtual assistant AI works on a predictive model where it checks the probability of a certain sound being a certain word to guess what you are saying. And newer abilities are being added every day where the AI can do things like understanding your mood and learning your preferences.

Although the innovations mentioned above are quite significant, let us not forget that necessity is the mother of invention. In the past years, the devices that can handle voice interaction have not only been limited to phones and computers. A lot more catego-



Car, destruct yourself

Can self-driving cars self-destruct itself in extreme circumstances where a crash is unavoidable? <http://dgit.in/CrSlfDst>



Watch Netflix offline

It is finally (almost and maybe here). With the next major update roll out, Netflix might allow you to watch offline. <http://dgit.in/NetfOff>

Geek life

ries have been included into “smart” devices, including smartwatches, smart homes and smart cars. Each of these platforms have different configurations, and hence need a system complicated yet reliable enough to function optimally with them.

With a combination of all these factors, it is quite evident that voice assistants have risen to their present level of efficiency. Let us have a deeper look at each of these platforms.

Apple - Siri

Since its introduction in October 14, 2011 on the iPhone 4S, Siri has virtually been integrated into the entire Apple ecosystem, except OS X. Let us accept it, even if Google got to voice recognition first, it was this witty talking assistant on the iPhone that suddenly made voice assistants popular. So much so, that Siri now has a pop-culture significance with respect to virtual assistants, enough to be featured in a Marvel movie!

Setting up Siri is quite easy, where it asks you to speak a couple of statements and also to set the voice gender, location and your nickname. Once that's done you are good to go. Although Siri has a lot of interesting features, we could not test a number of them as they were unsupported in India. Keeping that aside, Siri has a really high accuracy when it comes to detecting english and almost never mistakens what you said, even in a moderately noisy environment.

Considering the richness of the conversation, Siri does give natural replies especially for common queries like the ones about weather. But where Siri currently stumbles is understanding the context of two queries following each other, which is one more thing Google Now excels in, even up to more than five queries. Only rarely were we able to get Siri to understand a reply that referred to something from the previous reply and they were mostly from list results.

If we were to look at the features showcased at WWDC, where Apple announced the launch of Siri on macOS Sierra, the successor to OS X, it definitely looks like Siri is set to be a lot more capable than it is currently. The queries that were directed at it were quite complicated and contextual in nature and Siri did not falter with any of those. If only Apple launched its features at the same time in India.

Android - Google Now

In the group of virtual assistants that are getting better and better at having conversations with you, Google's combination of Google Now and “Ok Google” is comparatively silent. No, it doesn't do that to contemplate your personality better! As of now, Google's virtual assistant relies more on Google's own search power to solve a host of queries. There are a number of ways you can access this depending on the version of Android your phone is running. Lollipop detects “Ok Google” from any screen and launches the search app, unless you explicitly turn this feature off. We should inform you that keeping this enabled has reportedly caused some OEM phones to have microphone problems. Considering



Google hasn't yet announced any services that will be integrated with Google Home

Marshmallow, the latest version until N goes out of beta, “Google Now on Tap” is another feature that allows the launching of Google Now over any screen, giving relevant information pertaining to whatever is displayed on the screen at that moment. For example, if you are having a conversation with a friend about going to a movie, launching Now on Tap will show you the showtimes of the movie from theatres around you, the movie's rating on IMDB, and allow you to set a reminder to buy the tickets, all within the cards that pop-up when you long-tap the home button. Clicking on the various app icons (Facebook, Twitter, Youtube etc) will launch the particular app (if installed) or open the relevant webpage with relevant

content (the Facebook page or Twitter account of the movie, the YouTube trailer etc). Although this isn't strictly voice, it is definitely one of the best ways a virtual assistant can be used and activating this through voice (“Ok Google” anyone?) is just one step away for the prolific developers at Mountain View.

Google Now supports speech recognition in multiple languages including some regional Indian languages, but Now on tap only supports English, Japanese, German, Spanish, Italian, French, Korean, Portuguese, or Russian. “Ok Google” has one of the best regional language detections and offers really intuitive features without you having to explicitly enable or configure them. If only it could tell you a joke!

Special Note: Google Assistant, announced at Google I/O 2016 aims to be the spiritual successor to Google Now, taking Google's AI conversational. Two products have been announced with Google Assistant support - Google Home, an Amazon Echo inspired home assistant speaker from Google and Allo, a whatsapp like messaging app that will combine bots and voice commands.

Windows - Cortana

Due to the persistent comparisons between the three, it might be hard to accept that Cortana has been around for just two years and not more. Microsoft launched Cortana at the Microsoft BUILD Developer conference in April 2014, and if you really don't know the inspiration behind the name yet, you need to reassess your gaming creds. The name was inspired by a synthetic intelligence character in Microsoft's Halo franchise and the virtual assistant has been voiced by the same voice actor for the US-English specific version.

Microsoft has integrated Cortana into its entire ecosystem, including Windows 10, Windows 10 Mobile, Windows Phone 8.1, Microsoft Band, Xbox One and even launched apps for iOS and Android (although the Android version is in early access right now for India). Cortana has the usual features like its competitors do and can set reminders, show search results, read out the weather and more, all in natural language queries. Apart from this, you have access to Notebook, where



Airmail for Apple

Airmail is one of the smarter email clients available on iTunes and the Mac App Store for your Apple devices. <http://dgit.in/iAmail>



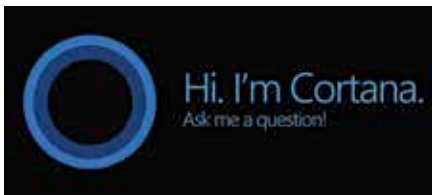
Livestream on YouTube!

You can now live stream videos directly from the YouTube app. <http://dgit.in/YTLivex>

you can specify your interests, and even remove those that Cortana detects on her own. It can also launch specific apps when asked and integrates into services like Foursquare to provide you information. Cortana also lets you set contact specific reminders which pop-up when you're communicating with the contact or depending on location as well. And if the thought of a virtual assistant constantly listening to you does feel slightly unnerving to you, then you can set do not disturb hours.

On PC, Cortana also integrates with Microsoft Edge to provide you features like Restaurant opening timings, reservations etc., on a restaurant website, coupons on a retail website etc. It has also been included into Skype as a bot to order food, provide info, transcribe videos and schedule appointments. On the Windows Mobile app, there is a constant effort from Cortana's side to keep the interactions within the app. For example, when we asked Cortana to book a cab, it showed us ten cab providers around us within the Cortana app itself, allowing us to ask Cortana to call one based on their position on the results.

On mobile, Cortana does indeed keep Microsoft's reputation consistent with the discrepancy in performance and setup process between its Android app (in early preview) and the Windows Mobile app. While the Android preview for India did not need



Halo-inspired Cortana is relatively new into the voice assistant category

any language configuration and automatically started with an Indian english accent and even told us Bollywood inspired jokes in Hindi, although it refused to understand Hindi itself. The Windows Mobile app, on the other hand, wouldn't launch with language set to English (India) and it had to be set to English (United Kingdom).

Cortana is expected to get a slew of new features with certain builds of the Windows 10 Anniversary update, and we can fairly say that the grounds are heating up.

Alternate platforms (Cars, Console)

Although the major focus of developing virtual assistants with voice recognition capabilities has been on smartphone developers, other product categories are also heating up when it comes to incorporating speech as an interface. One such category is connected cars, or more appropriately, smart cars. Even moderate range luxury cars had certain voice operated features since quite a while and the same goes for Bluetooth connectivity to your phone. Now, major software giants and car manufacturers are collaborating to create and incorporate operating systems for smart cars that enable them to be much closer to the virtual assistants that we are implementing on our phones. Android Auto, which works by connecting an Android phone to a compatible car, allowing you to use Google Now in your car. Apple wasn't far behind and had launched Apple Carplay with iOS 9 that essentially gives you the same capabilities with your iPhone. Both platforms have been picked up by a large number of manufacturers and soon, you will be talking to more than your co-passengers in your car.

Microsoft has also announced that Cortana is coming to Xbox. This opens up a lot more doors for voice interaction. Maybe you can pause your next Halo game just by asking Cortana to do so. This is in line with Microsoft's goal to unify the Xbox and the PC. And since Microsoft is doing it, we can expect Sony to catch up pretty soon.

A smart home wouldn't really be smart if each time you had to interact with it. Or you would have to deal with a mind boggling array of switches on a highly complicated panel, would it? That is exactly what makes home automation the perfect use-case for voice interfaces. Hence it is no surprise that Amazon's online store is actually running out of Echo. Its smart-speaker can talk to you, a number of apps and services and any smart device that it is connected to, thanks to Alexa, the onboard virtual assistant. Even Google has jumped into the fray and

announced Google Home, which sounds quite similar to Amazon's Echo. It is yet to be seen what Google's expertise with Google Now does to this product.

Beyond platform restrictions

Microsoft might have launched Cortana for Android and iOS, but there is no doubt that it works best on Windows. Apart from that, neither Apple nor Google have truly launched their virtual assistants beyond their own ecosystem. So if you are looking for a platform agnostic virtual assistant to talk to, you might have to look harder. The Google Play store might have a few interesting options. We tried Assistant and it definitely has a sense of humour. Even though it is quite capable, the robotic voice and the multiple redirect to its internal browser with search results was quite dull, compared to the contextual results we get from the standard voice assistants.

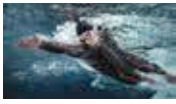
Dag Kittlaus and Adam Chayer, creators of the AI behind Siri, have recently shown off their newest creation. Viv, a

platform agnostic virtual assistant is to be launched with certain third-parties towards the end of the year. It's more similar to Amazon's Alexa and Facebook's Messenger bots than Siri or Google Now in its integration with third party services. Their demonstration at the TechCrunch Disrupt NY in May this year showed Viv being able to handle fairly complex queries both in terms of breadth of AI and depth speciality. Due to their strength in AI and lack of a software giant's pressure behind them, they hope to get a large number of third party vendors on board and make Viv something as ubiquitous as Bluetooth or Location tracking currently.

With all these developments, and the opening up of Siri to third-party developers, we can only predict that speech as an interface is headed towards widespread usage. Because once it gets easy to talk to your devices from across the room, would you really want to play with buttons anymore? Do write in to us and let us know. [d](#)



Amazon's Echo with Alexa will soon understand your emotional state as well



Optimal buoyancy!

For \$1000, you can buy a swimsuit that makes you float better.
<http://dgit.in/Wetsuitx>



100 million WhatsApp Calls

WhatsApp claims that more than 100 million calls are made daily using their platform.
<http://dgit.in/100mCalls>

Feature

AUTOMATE THY HOME



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Imagine this – you are returning from office in your self-driven car and as you approach the garage, it recognises your car and opens the door. As you get down and are about to enter your home, your living room door does the same. Behind you, it locks again and the face scanner reactivates. As you enter, your house has already cooled itself to an ambient temperature because your AC had already sensed your impending arrival, while queuing up your favourite tracks on your connected music system. You ask your digital assistant to read out your personal emails, and at that very moment the music volume goes down and your email is read out via the same speakers. Your TV switches on to

display the attached images and the lights in the room change colour to match the multimedia content on the screen. You close the emails with a gesture, ask your digital home assistant to turn up the music again. Finally, you get to relax and have some coffee that was just the right temperature, because you set the coffee maker via its app before you had left.

No, we are not describing a scene from a science fiction movie or the Jetsons animated show. Albeit in fragments, but home automation has eventually arrived at a juncture where it is no longer just another crowd-funded or in-the-labs piece of technology – it is here and it is ready, right here in India. From smart lighting to smart switches, connected video door lock panels to connected home entertainment systems, there are already multiple players, both startups

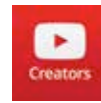
and established entrants, vying for the best seat in this currently popular field of devices and solutions. In fact, there might be too many options, not all of which might measure up to the standards of the ‘smart home’ that you are visualising. So how do you go about automating your home? We’ve got you covered.

Automate what?

It has been quite a while since we started having apps for everything. We can say that there is some degree of automation in a lot of things we already do. Be it a fully automatic washing machine that knows exactly what to do with your laundry automatically or automatic parking assistance where your car helps you park it. While bringing this trend of automation to our homes, multiple avenues of automation are being sought

What is Brexit?

Google search results analytics shows many UK voters didn't understand Brexit and started to look it up only after they had voted. <http://dgit.in/BrexitGgIT>



Rejoice YT Creators!

With better creators support, YouTube has added many such new features to its Creator Hub launched at VidCon. <http://dgit.in/YtCrtr>

and explored. An interesting story about a fully automated future home sounds nice, but before you automate your home, you need to do some analysis and understand what actually can be automated right now. You also need to determine to what degree you want your home to be automated. When it comes to devices, the essential categories are as follows -

- **Entrance Management** - Digital door locks with audio/video support
- **Security** - Panic buttons, sensors that detect gas leaks, heat, fire, intrusion, motion
- **Device Control** - Smart switches, smart lights, thermostats, sprinklers, automated devices
- **Scene and Entertainment management** - Saving and using profiles for multiple devices (like party mode), connected home entertainment system.

Automate how?

Whenever the topic of home automation comes up, one of the first topics of concern is connectivity. After all, you aren't replacing everything in your home with completely new gadgets that have totally new methods of operation! You're simply trying to automate the existing ones, and for that you need connectivity. There are mainly two ways in which home automation companies are approaching this. Let us find out more about both of them.

Local Wi-Fi+Internet connectivity with centralised hub

This approach usually involves installing a central hub somewhere in your home and allowing it to use your local Wi-Fi to connect to all the smart devices intended towards automation. The devices, on the other hand, will also be connected to the same Wi-Fi network. The on-board receivers will receive commands and the transmitters will provide status and usage data. And if the local network setup has internet access, most such setups can be controlled via an accompanying app, which more often than not forms the basis of controlling your smart home.

This Wi-Fi setup works in tandem with each device and its components. For example, converting a regular switch-

board to a smart switch mostly involves inserting a separate switch controller module behind the switchboard. This module can receive on and off commands from the hub, and some can even support dimmer switches. A smart door lock would use image processing locally to identify a person at the door and control the locking mechanism accordingly. The lock can detect a forced intrusion if any and send you an alert on your phone via the hub. It completely depends on the implemented device as to how it will put the connectivity to use.

Infrared remote operated

Almost every device around the house is connected to a plug, and if it is not (like a curtain) then the process of automation might require it to be connected to one. And there are companies that are manufacturing plugs and switches with infrared sensors so that they can be controlled via IR blasters on smartphones or proprietary remotes provided by the manufacturer. This method often accompanies the Wi-Fi method as an additional perk, also because it is often the faster alternative. Although, this is not entirely applicable to devices that need more than a turn on/turn off functionality.

Indian automators

If what you've read so far makes you wish to visit your local market and buy some home automation stuff, hold onto your horses! Some of the best home automation solutions in India are being created by startups. Take Air from Leaf Technolo-



Air from Leaf Technologies has the looks and the features to make it a good choice

gies. It is a hub-based home automation system that comes with a slew of smart switches of various power levels and dimmable options. The first thing that you will notice is the design on this device. It is not just another bulky device that you will have to hide behind some box or panels in your home, you would want to flaunt this. Once you put that aside, this device does have features that puts it higher than just a smart switch controller. Air lets you lock your appliances so that they can't be used if you are away and alerts you about any intrusion once security mode is activated (using its motion and presence detectors). The switchboard also serves the purpose of a surge protector with its internal fuse and switches off devices when the hub senses that nobody is in the room. Most importantly, the accompanying smartphone app tries to learn your preferences and can schedule repetitive tasks.

There are a number of options available which operate like Air, such as Cubical switches from Cubical technologies. Devoid of the advanced sensors, they are priced more flexibly between ₹6,000 and ₹14,000 depending on the number of switches you choose and if you choose a cam at all. eGlu from Wizin systems takes this slightly further by throwing in smart tags and panic buttons as well. It lets you figure out the connections by yourself if you want, although we cannot assure you if it is truly DIY as it is not released yet.

There are some providers who are doing more than smart switches. Silvan home automation solutions is an overall home automation product that is designed to be incorporated right from the construction of the house. They have already worked with Lodha builders and Tata Housing, so they have already bagged in big clients. They offer products in all four of the categories that we mentioned earlier, although the pricing is only available on consultation. They are also into board room automation, hotel room automation, school security etc. This might be a good balance between comprehensive solutions and technical innovations, for instance, their smart camera can detect people loitering around your premises and send you alerts accordingly.



Back to BlackBerry

Miss your BlackBerry OS? Here's how you can transform your Android to look into one. <http://dgit.in/AndToBB>

Not so creepy, Apple

Following differential privacy, Apple will not collect any data secretly for its AI training, unless you allow it. <http://dgit.in/iDiffPrv>

Feature

Another startup that is making quite a lot of noise in the Indian home automation scene is Inoho. Although it doesn't have a range of options, it does what it does well. It specialises in remote switches that can be controlled via an app. It was founded two years ago and has gone on to become one of the highest funded startups in this segment. Inoho's products are also available on Amazon at ₹11,999 for a starter kit that includes a controller and a 5.1 switchboard and ₹5,499 for 5.1 or 4.1 switchboard panels.

Apart from startups, some established brands are also offering home automation solutions and you might just decide to go for reliability over other factors. Oakter offers kits at flexible price segments that include Smart plugs, thermostats and switchboards and range from ₹2,800 to ₹10,000 while letting you build your own kits. Anchor by Panasonic offers a premium range of products with its Ave Domina fully scalable home automation system as well as standalone products. Anchor's products are not being sold online and are available at a store near you as of now.

Global Standards

Almost every global software giant is now gradually getting involved in home automation, along with a number of manufacturers who have already made a global reputation in this field. Belkin, with its WeMo line of products, can be considered as a global equivalent of Inoho, with good reputation in whatever few products it is producing. Nest, currently



Belkin's WeMo line is quite popular globally as home automation devices



Given the popularity of iOS devices, HomeKit shows huge promise

owned by Google, makes some really well designed products. These guys designed the iPod after all. The Nest learning thermostat, which, as its name says, learns your cooling and heating preferences over a week of usage. Its other two products, the Nest smoke and Carbon Monoxide detector and the Nest smart camera are equally intuitive. The smart camera actually incorporates a feature called Nest Aware that you have to sign up for, which allows the camera to use advanced algorithms to separate false alarms from tree branches and harmless objects from actual intrusions and risks. It also does the same for sounds.

Considering the number of good brands out there with a number of good end products, it is not feasible to list all of them here. Rather, what's impossible to ignore is the rise of voice as the future of home automation. The idea of a perfectly automated home is one where you don't have to figure anything out and the home does everything for you. Voice is a natural interface for that level of automation, as it removes the need for buttons and allows you to operate your devices with natural language commands. Amazon's Echo with the virtual assistant Alexa can interact with hundreds of devices and services, and according to latest developments, it will soon be able to grasp your emotions and respond accordingly. No wonder Amazon is having trouble keeping these in stock. This is exactly

why Google has also announced Google Home, their own version of the Echo.

Although Apple hasn't launched or announced a similar hub, what is announced and released is Homekit. It's a framework for home automation that lets you make your devices talk to each other and lets you control your smart devices using Siri. This will be possible even when you are away from home (if you have a 3rd generation or higher Apple TV and they are connected to the same network). Apple has also included a Home app on iOS 10 for streamlined setup and control of your home from any iPhone, iPad or iPod touch running iOS 8.1 or later, or an Apple watch with watchOS 2. According to Apple, over 50 manufacturers are making accessories for Homekit.

The Future Home

We already have a lot of devices available that definitely seemed like science fiction even 10 years ago. With the growing proficiency of the voice interface, the perfect smart home that we described in the beginning soon might not be as imaginary as you think right now. It will surely feel more natural to just speak your plans out loud and have your devices work on them for you. For instance, making dinner plans? Simply speak out, "I'm making Pasta tonight for three friends with whom I'll watch football" and watch your home spring into action to make life easier for you. 📺



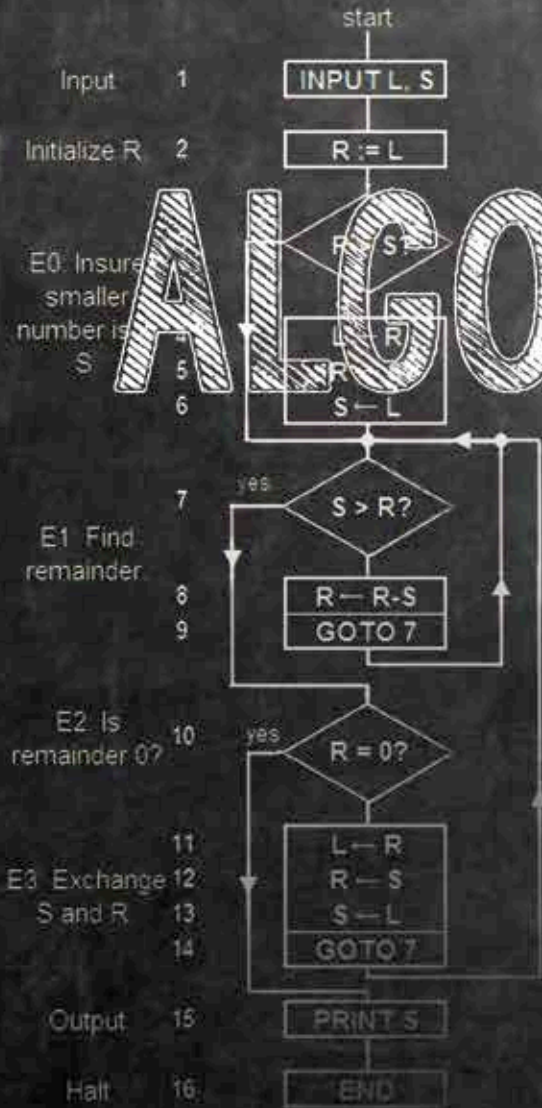
Wicks quits Motorola

Man who worked on the designs of Moto X and Moto 360 smartwatch leaving after 15 years of service. <http://dgit.in/jimwick>



4k projector under \$3k

Epson launched 2 "wireless HD" 4k projectors which they plan to price at less than \$3000. <http://dgit.in/ep4kproj>



ALGORITHMS

From Babylonians to today's cryptographers, algorithms have progressed meticulously through generations, evolving into the life-blood of modern day computing

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dhəm

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By definition, an algorithm is a pre-defined, self-contained set of instructions required to execute diverse functions. Such rules date back to as far as 300 BC, found inscribed on Babylonian clay tablets. The very basic algorithms were marking schemes that the ancient folks used to keep track of their grain stock and cattle. This was followed by the advent of the numeric system, and a subsequent evolution of abacus, algebra and variables followed, giving rise to symbols and rules involved in formulating evaluation systems.

Algorithms find their place in computer programs and mechanical applications. The origin of the term is attributed to Persian astronomer and mathematician, Abu Abdullah Muhammad ibn Musa Al-Khwarizmi (c. 850 AD). His works included introducing the decimal positioning within numeric systems to the Western world, along with the first ever systematic solution of linear and quadratic equations. In its original, rudimentary form, algorithms, known as algorism, was regarded as rules for computing calculations and performing arithmetic with Hindu-Arabic numerals. Later, with the Latin translation of Al-Khwarizmi's name, algorithms set definite standards for performing computations to execute tasks.

Algorithms, as we know today were only put into place with the advent and rise of mechanical engineering and processes. In its original form, algorithms gave a base to the algebra of logic, using variables in calculations. The earliest instances of algorithms include Euclid's function of greatest common divisor in numerics, Archimedes' approximation of Pi, and Eratosthenes' calculation of prime numbers. However, the first



Tesla SolarCity offer

Tesla has offered 2.8 billion dollars to acquire SolarCity, the solar panel company. <http://dgit.in/solartes>



Electronic Persons

Motion passed by the EU classify's robots as 'Electronic Persons' with social security. <http://dgit.in/robotpeople>

Origins

person to use the initial form of the term algorithm was 12th century English philosopher, Adelard de Bath, who used the term algorismus when translating Al-Khwarizmi's Arabic works.

A major series of achievements in the evolution of algorithms came during the 1800s, the first of which was established by English mathematician George Boole, who also penned The Laws of Thought and established Boolean Algebra. In 1847, Boole unified logic with calculations and formed binary algebra, the basis of computing logic of today. In 1888, Giuseppe Peano established the axiomatization of mathematics (an axiom is an empirical rule established in certain fields, and used without exceptions universally). He used equations with symbols to obtain results. These would later go on to become rules that modern day mathematics and algorithms are based on.

Decades later, algorithms of the present form came into being with Alan Turing's computing machine. Alongside, Alonzo Church's Lambda Calculus became the calculating equivalent of Turing Machines, wherein a variable was bound to specific functions or executable equations to carry out operations. Turing's computer model was based on the notion of a human computer and "states of mind" or environments, in which functions written down in symbols would find application. This was further broken down into basic squares, with each contributing to a specific operation. Each of these basic squares would hold a symbol, and each symbol would be finite in its own state and relativity.

A computer's action would depend upon the tally of logic - each of these symbols acting as bits of data, and the computer's "state of mind" being the condition or purpose of the function being executed. Turing also imposed a limit on the number of symbols being tallied at the same time, and computing more complex logic would require the machine to execute similar, consecutive operations. Each of these operations, hence, would be the simplest unit within the executable 'code'. A code would be the entire compilation of the sets of functions, or



Euclid: The foundation stone for possibly the world's first functional algorithm

the algorithm, based on which a problem would be solved.

Turing's logic of algorithms also laid down the foundation for operations involving variable factors, wherein a subsequent symbol would be altered based on the computation between two preceding symbols. In simpler words, when a function between two variables is executed, the resultant would be the figure that would be used in computing with the next variable, thereby giving rise to progressive algorithms that take into account changing values to compute a code. If need be, these operations would also define the outcome, altering the "state of mind" or parameters of a calculation. "We may now construct a machine to do the work of this computer," Turing deduced in his theory.

Meanwhile, the foundation laid by Alan Turing, and also applicable




Alan Turing: The father of modern cryptography and algorithms

to Church's Lambda Calculus (stated earlier), was worked upon by Church's student and American logician, John Barkley Rosser. Defining an "effective mathematical method", Rosser stated that each step of an algorithm has to be precisely defined and not left to variable outcome chances, with a finite number of steps to obtain the outcome. This, in compliance with the foundation work laid down by Alan Turing, led to the need for a computing machine that would operate and execute commands without the need for human intervention.

This was followed by the establishment of Stephen Kleene's 'Algorithmic Theory' in 1943. Kleene stated, "In setting up a complete algorithmic theory, what we do is to describe a procedure, performable for each set of values of the independent variables, which procedure necessarily terminates and in such manner that from the outcome we can read a definite answer, "yes" or "no," to the question, "is the predicate value true?"

Kleene's theory set up the rule that algorithms of today follow - independent, self-sustaining computational functions that would execute operations within a finite set of instructions. This made computing faster, and with the advent of personal computers from the late 1960s, algorithms have seen improvements. Present applications of algorithms are found in every single moment of our daily life. For instance, on a smartphone, the colour balance of photographs captured by its camera is defined by a set of algorithms, which identifies colours and balances contrast based on a scene. With increasing processing power, algorithms have grown in their complexity and level of computational prowess.

The present generation is gunning for quantum computing and artificial intelligence. Machine learning depends on algorithms to "learn" from usage methods and prepare actions based on personal ways of operations. We are on the verge of time where 'bots' are looking to replace apps of our daily use. Algorithms are behind every nascent stage of technology, having evolved in their ability, while keeping the basis of operations constant. 

37

Space age

The symphony of the stars and how we can listen into the orchestra, along with space shocks.

42

From the labs

With cattle rearing contributing 18% to global carbon footprint, it's time to develop food in our labs

Imcoming: WIRELESS NIRVANA?

Wireless identification sensing platform's about to disrupt the wireless mobile device industry big time





Boom with Siri

Ultimate Ears adds Google and Siri voice integration to UE Boom 2 and Megaboom Bluetooth speakers. <http://dgit.in/UeSiri>



Gameboy phone?

The Hyperkin SmartBoy allows you to turn your phone into a GameBoy. <http://dgit.in/smartboyx>

Tomorrow's tech

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An oft-abused term in the technology arena, to achieve 'wireless nirvana' meant making wired electronic devices stay on and functional without wires. How naive of us that this gradual shift alone would rid us of our gadget trials and tribulations, help us attain nirvana. Pfft! Back then were the early days of the digital age. We were easily swayed by delusions of technical grandeur. We were too hasty in patting our backs by merely eradicating wires than to comprehend the limitations of two things that propelled the wireless age – radio waves and battery – the latter of which continues to be the catalyst of many shattered wireless dreams.

Not anymore, though. Not if WISP can help it.

Well, imagine a microcontroller – a chip – that for all practical purpose powers itself without any batteries or plugged in power source and be receptive to programmable wireless instructions. Sounds something straight out of a futuristic sci-fi movie, isn't it? Not at all. This is the power of WISP, a breakthrough protocol that couldn't have come any sooner to rid us off our wireless woes! The topic of this article – you guessed it – is about looking into what WISP (wireless identification sensing platform) is all about and just why it is that it promises to hold so much potential as far as revolutionizing wireless communications in the coming years.

In the beginning...

The WISP project grew out of an Intel Labs initiative nearly 12 years ago from the company's office in Seattle. What began as a project to make iterative breakthroughs to steadily progress the cause of wireless communication, J.R. Smith, a lead researcher on the project, describes how it quickly became "the first far-field RF powered sensing and computational platform." Those early days of WISP weren't without successful failures and lots of learnings, according to Smith, who recounts how he inducted more

researchers under him from the University of Washington (in Seattle) and even went all the way to fabricating an early chip on which to implement the RFID tag through the Intel Shuttle Program before it was shut down. In 2009, WISP was mentioned under the archive of innovation at Intel.

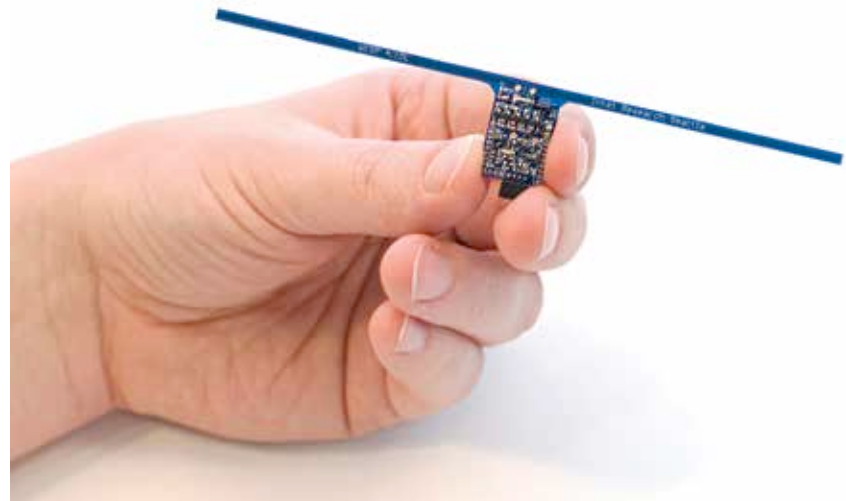
However, the project wasn't completely on the backburner as far as the University of Washington was concerned, and with the help of TU Delft (the largest and oldest public university of technology) in the Netherlands, they've really unearthed some breakthroughs in WISP.

Wispy magic

So far, RFIDs have always needed two things to work -- power (either in the form of battery or plugged into AC source) and

benchmarks, but it's a chip that's several times more powerful and larger than anything researchers have tried to power and program using only radio waves (or ambient energy) so far. That's right, WISP chips are the only ones in the world that can be wirelessly reprogrammed, a feat that other RFID devices that power themselves off stray radio transmissions like television and mobile base stations still cannot do. And for that fact alone, this communication breakthrough is of great significance.

How does it work its magic? Well, the group of researchers from America and the Netherlands who developed the WISP5 sensor attribute the platform's success and its ability to operate at such infinitesimally small packets of energy to the use of a ferroelectric RAM module.



The original Intel prototype developed before the Intel Shuttle Program was shut down

wired connectivity for it to be reprogrammable in any way. And the same holds true for other wide-scale deployments of similar wireless protocol. Both these physical hurdles of battery and wired connectivity are finally being overcome through the latest iteration of WISP, according to new research breakthroughs coming from the joint work of both the American and Dutch university students and faculty.

No longer based fully on the Intel architecture, the RISC-based 16-bit microcontroller that's modestly clocked at 16MHz won't break any performance

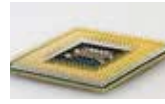
How's it crucial? In comparison to NAND modules that make up conventional RAM modules from pretty much every device you can think of – smartphone, PC, gaming console, router, laptop, etc. – a Ferroelectric RAM or FRAM module requires just a tiny fraction of energy, which is about a hundred times lesser. And in the realm of ambient energy powered electronic devices, this is again an important breakthrough.

Where earlier RFID sensors relied upon dedicated batteries or power sources to be in an always ON state or turn ON (based on RF input) to establish a mode of



IBM Deep Thunder

IBM claims that Deep Thunder can forecast the weather to the scale of a city block <http://dgit.in/deepthunder>



The KiloCore chip

The KiloCore chip created by UC Davis boasts being the first with 1000 independent processors <http://dgit.in/kilocore>

communication or to simply just receive instructions and act upon them, now with WISP5-enabled sensors you don't need them to be connected to any power source or have them hooked into a battery module. What's more, the FRAM inside them will ensure incoming (or downstream) wireless data linkages operate at nearly negligible power draw. In fact, because the WISP5's FRAM module is so darn power efficient, the chip receiving external wireless instructions can power on instantly, download data, power off in a blink if incoming signal wavers, then power back on in a zap and continue from where it left off.

Also, a critical component of the work credited to the TU Delft part of this WISP team is when they came up with a very fast downstream data transfer mechanism

times faster than a baseline, non-adaptive shortest frame case, found in most RFID implementations. Based partly on this, the team was able to successfully demonstrate how Wisent enables wireless CRFID (computational RFID) reprogramming, demonstrating the world's first wirelessly reprogrammable (software defined) CRFID.

Not just that, although diminutive and tiny, WISP-enabled chips have been implemented in complex cryptography and security scenarios also, giving it a crucial integrity layer which is essential for real-world deployments of WISP-enabled devices and solutions in the coming years.

Reality check

Promising no doubt, but we need to put things into perspective about WISP5. If

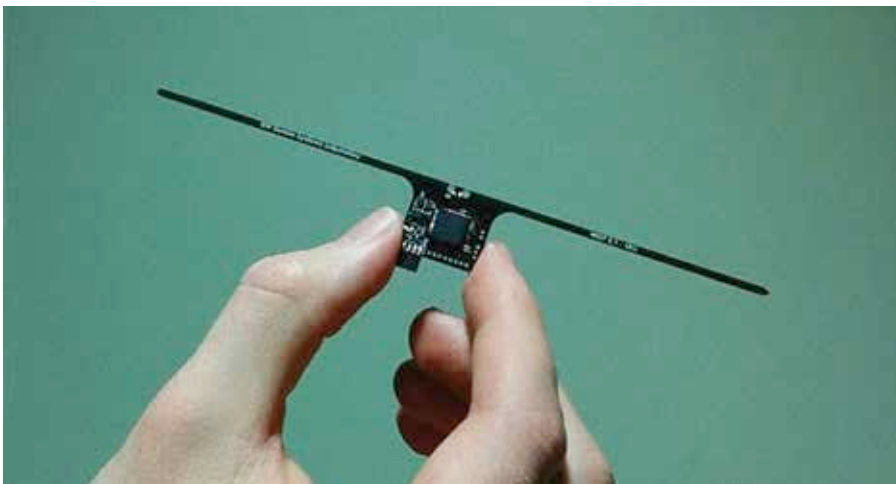
game, but it can track sensor data, do some minimal processing tasks, and communicate with the outside world."

And that's exactly where WISP's going to have an immediate impact. In the world of sensors, deeply embedded systems for extremely long-term deployments, WISP-enabled devices will make a lot of sense to a lot of companies. The breakthroughs achieved in WISP-enabled chips hold a lot of promise for the Internet of Things wave of devices.

Right now, probably a WISP-enabled sensor can't be more effective for sensing things like temperature, orientation, and acceleration, besides doing some low-intensity calculations on-the-fly inside a Fitbit-like wearable device. In time, the scale of computational prowess will only grow, and WISP-enabled devices will be more prevalent. But this is looking really far into the future.

Just think about it. In the field of healthcare, where deeply embedded sensors like pacemakers for the heart and other sensitive organs is concerned, WISP-enabled tiny, passive nodes can be inserted. Unlike existing pacemakers which need to be replaced only through invasive surgeries, these future WISP-enabled pacemakers could be reprogrammed and powered effectively through just radio waves. Similarly, in the housing and infrastructure sector, WISP-enabled sensors can be deployed in structural beams of buildings to monitor the structural integrity of a building without the need of complicated plumbing for routing wires or large-scale battery installations on site. And wouldn't it be great to have a smartphone someday that isn't constrained to the Li-ion battery it bundles with it and can work, in some small capacity, completely through wireless power harvested from radio waves? The possibilities are truly mind-boggling, if you think of it.

The researchers working hard on WISP and Wisent want to realize the dream of truly wirelessly reprogrammable software-defined battery-less computers (not just sensor nodes) whenever and wherever we want. For their sake and the rest of us digital natives, we hope that day is not too far away in the future. ■



A chip that can doesn't need external power sounds like Sci-Fi, yet here we stand!

dubbed Wisent on to the WISP chip. In their findings, they realized that a lot of work had gone into optimizing data upstream from an RFID tag and its corresponding client device. Curiously, however, the TU Delft found downstream data transfer from a client device to an RFID tag (similar to a WISP device) severely clunky with a lot of room for improvement. And that's exactly what they got busy with.

The research team attributes the novelty of Wisent to its ability to adaptively minimize the transfer times at varying channel conditions between the RFID tag and client device. Their experiments show that Wisent allows data transfer up to 16

you thought you'd have WISP5 toting smartphone and smart home sensors come CES 2017 or MWC 2017, time to curb some of that enthusiasm for now. There's a long road ahead before WISP comes to an off-the-shelf device which you and I can purchase.

The WISP5 module (pictured above) is supposed to be a proof of concept at the moment. It can only hold 64KB of memory and as you read earlier in the article its clock speed of 16MHz doesn't really make it a candidate for use in even modest computing devices. According to Aaron Parks, development team lead for WISP at University of Washington's Sensor Lab, "It's not going to run a video



Lower-fat chocolate

Using electrical engineering physicists have come up with a way for even lower-fat in chocolates. <http://dgit.in/lowerfat choc>



Google maps' 'Sea Monster'

A 'sea monster' that was supposedly caught on google maps turned out to be just a rock. <http://dgit.in/monster rock>

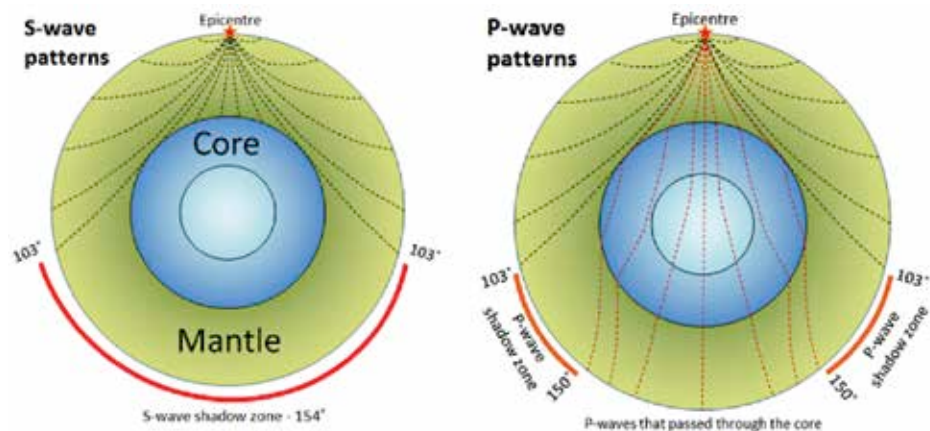
ASTEROSEISMOLOGY

Stars also experience seismic waves due to their massive energy. Although their sound cannot travel, with the right technology, you can hear the the symphony of the stars.

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The word Asteroseismology can easily be broken down into its constituents to reveal its meaning. 'Astero' most probably derives from 'astro' which relates to stars and seismology is the study of the propagation of elastic waves, 'quakes', through the internal structure of a large geological body like the Earth. Asteroseismology hence is the study of seismic waves in stars. By studying these wave induced oscillations, scientists can decode the internal structure of stars, making asteroseismology an invaluable tool for astronomy. Seismic waves have long been used to map the structure of our planet's interior. Waves that travel in the interior of the Earth are of two types - p (pressure) waves and s (shear) waves.

Since both waves are different in nature, they travel differently in liquids and solids. In the event of an Earthquake, both P and S waves are generated in the Earth's body and by measuring the intensity of these waves geologists have resolved the internal structure of the Earth upto a resolution of a few hundred kilometers. Asteroseismology uses a similar principle to study what goes on inside stars. In this article we discuss how this nascent field helps physicists and astronomers obtain invaluable data about stellar bodies in our cosmos. We highlight how asteroseismology allows us to 'hear' stars and what that truly means. The stars across galaxies pulsate and throb like a chaotic orchestra. What if we can tune into the cosmic concert and listen to the symphony of stars? You better have a good seat for this one.

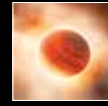


How S and P waves resolve the Earth's internal structure owing to their respective abilities or inability to pass through solid and liquid layers



64-bit ARM for Post-K super

ISC Fujitsu has decided that it was use 64-bit ARMv8 cores for its 1000 PFLOPS super computer. <http://dgit.in/postksuper>



Youngest exoplanet

The youngest known exoplanet discovered so far, K2-33b can teach us more about planet formation. <http://dgit.in/k233b>

Why Asteroseismology?

Stars have been guiding bodies for modern astrophysics. Much of what we know of our universe is from observing stars that pepper the multitude of galaxies. Most modern astronomical methods rely on deconstructing the light coming from stars. While classical methods have given us an idea of stellar physics, scientists have to rely on simplistic models to unravel the host of processes that dominate the world inside stars. Internally, stars are charac-

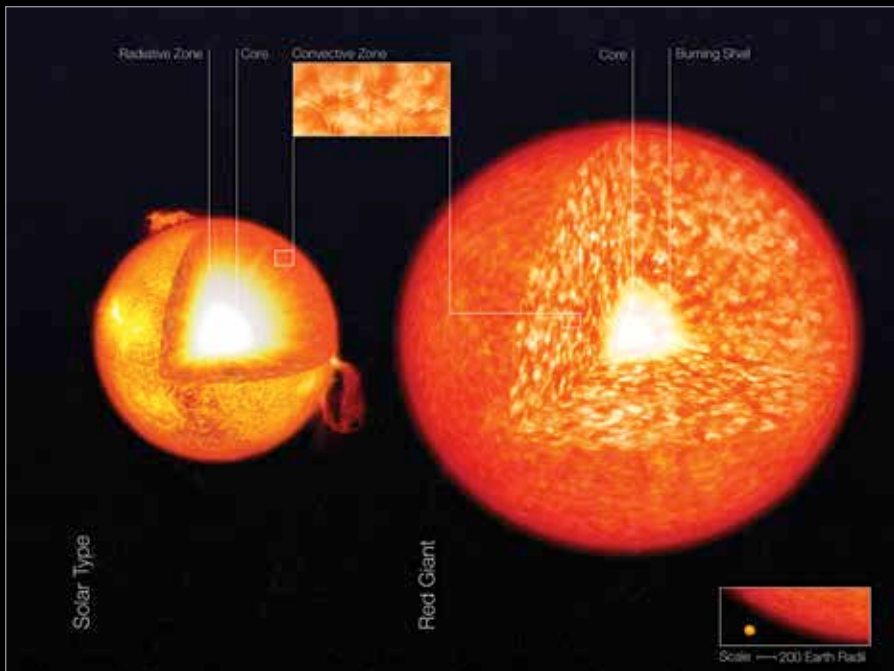
star - including its composition, structural properties and evolution.

What are stellar oscillations?

Stars, giant bodies of gas and plasma, usually exist in a state of equilibrium. The gravitational pull exerted on its elemental constituents is balanced by the massive amount of gas pressure inside the star. Any small perturbation however can cause a departure from equilibrium and lead to a state of oscillation - short lived

acoustic waves cannot travel through the vacuum in space (sound is longitudinal and needs a medium to propagate) they provide the perturbation that disturbs a star from its rest equilibrium state, causing it to oscillate.

Spherical bodies have three degrees of freedom and hence have multiple modes of oscillations, the simplest of them being radial modes. Radial modes manifest as a periodic expansion and contraction of a body in such a way that the stars spherical symmetry is conserved. The periodic displacement is hence equal in all directions. Imagine squishing a soft ball in such a way that the force used to compress and release is equally transmitted in all directions. At any time during this periodic motion, the ball retains its spherical shape with only its radius constantly increasing and decreasing with time. Non radial modes however don't preserve such a symmetry. The star oscillates in such a way that it loses its spherical shape. These non radial oscillations distort the star's surface in such a way that while some areas are expanding, some recede, hence leading to the formation of some exotic shapes. Stellar oscillations essentially refers to the distortion of a star's shape. Asteroseismology aims to study these oscillations in 'pulsating' stars and from it carry out a sort of reverse study to map the acoustic waves, find their origin and ultimately chart the composition of a star. Some GIF animations of the various shape modes can be found here : <http://dgit.in/Astroseismo>



Artist's impression showing the the radiation and convective zones in a star

terised by large scale convection, mixing, diffusion, and a host of chemical, hydrodynamic and magneto processes that are too complicated to be studied by approximate parameters used to model such processes. Simply put, most techniques offer poor precision. By studying stellar oscillations, the uncertainty in current models can be reduced significantly, thus providing scientists a viable diagnostic tool to study stars in their full glory. The inside of stars are inaccessible via traditional observation techniques. The advantage of using asteroseismology is that because stellar oscillations are almost uniquely a function of a star's properties, and different modes penetrate to different depths in a star, we can get high precision information about the various internal layers in a

or controlled. Imagine a block of wood connected to a spring system, left to fall under the influence of gravity. Instead of simply dropping the block, if we slowly guide the block and leave it, it reaches a certain height (its equilibrium height). Now if we disturb the block from this rest state, it begins to oscillate about that level. In real life, because the block will face air resistance, the motion gets damped and ultimately dies down. In an ideal scenario however the block continues to oscillate about its equilibrium position. Transfer this one dimensional picture to the three dimensional spherical shape of star, and it's not as easy to visualize these oscillations. Stars are far from being quiet bodies, with sound waves being generated in plenty due to its internal processes. While these



Experimental Zika Vaccine

Researchers will be testing a new experimental vaccine for the Zika virus on humans for the first time.
<http://dgit.in/zikavaccine>



Gravitational Waves Again

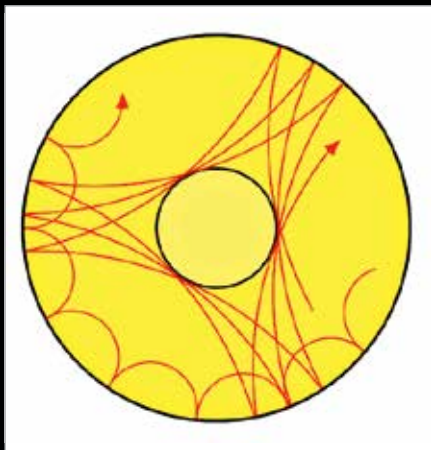
The scientists at LIGO have claimed to have detected gravitational waves a second time.
<http://dgit.in/gravitwave>

Space Age

convective layers. These convective layers are home to large scale turbulence that generate acoustic waves in a large range of frequencies. These waves drive random stellar oscillations and occur in stars that have masses and evolutionary patterns similar to the Sun. Since these stars are intrinsically stable these random oscillations have small amplitude and generally short lived.

Ok. So now we know what stellar oscillations are and how stars oscillate, but how does asteroseismology use this information?

Because sound cannot propagate in space, sound waves remain trapped inside



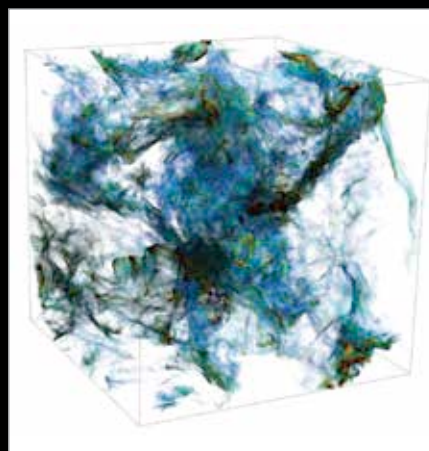
Owing to differential sensitivity of modes we can observe different regions in a star

a star. But as we discussed these sound waves cause a star to pulsate, oscillate in a combination of modes. These oscillations provide us with an indirect way to listen to the sounds of star. As the surface of a star recedes and expands the gas inside is compressed and then rarefied in the process getting hotter and then colder. These changes are then reflected in the light emitted by the stars. Thus, by measuring the light output of these pulsating stars we can gauge the frequencies of oscillations and the sound waves inside the star.

But, now that we have the frequency of oscillations and the frequency of sound how do we map the internal structure of a star with that information? One of the primary goals of asteroseismology is to

measure the speed of sound waves in a star. Sound waves propagate longitudinally. In a gas this results in information transfer by compression and rarefaction events, via collisions at the molecular level. This is important as it highlights the dependence of the speed of sound on how frequently molecules collide, which in turn is determined by temperature. The higher the temperature of a gas, the more mobile and energetic are the molecules and this increases the speed of sound. At a given temperature, a lighter gas moves more quickly than a more dense one. Speed of sound is thus critically related to the density and temperature of a gaseous medium. Using observation techniques like spectroscopy and photometry scientists can measure sound wave data within a star. Then, by making use of standard models, the wave data can be interpreted to give details of speed of sound waves, which in turn can be used to gauge density and pressure of the gas medium. Arguably the most important physical relation in thermodynamics is the equation of state, which relates the temperature of a state to its density and pressure. Armed with data of pressure and density of the gaseous medium that fills up the star, along with some assumptions made of the chemical composition of the gas, a plot of temperature within the star can be derived.

The many modes of oscillations also have importance in decoding a star's internal structure. Waves dominating the interior of a pulsating star can be broadly



A high fidelity numerical simulation showing the formation of a star (Credit : NASA)

classified into two modes - the p mode that stems from pressure as a restoring force and g modes that originate from gravity behaving as a restoring force for stellar oscillations. Different modes penetrate to different depths of the interior owing to difference in their nature, much like the s and p waves discussed in the context of earth based seismology. Because waves of a certain frequency and propagation direction might be sensitive to the physical conditions prevailing in



Much like an orchestra with different instruments a star oscillating with different modes can be 'heard'

different regions of the star's interior, by studying different and more pulsating modes we can cover a larger area of the star's inner structure.

Can we actually 'hear' stars?

Music is essentially a combination of a large number of instruments emitting sound waves of a certain frequency and amplitude. If we stand in a concert hall with a famous orchestra playing their famous score we can make out every individual instrument, while also appreciating the combined effect of music as a whole. Our brain is attuned to splitting a signal into its constituent waves and recognizing a unique sound, as it is capable of enjoying the power of music. When a star oscillates, its surface beats in a unique rhythm, driven by the breathing in-out of the sound trapped inside. While the natural frequency of stars is too low for humans to perceive the sound, when we capture the frequency, amplitude and phases associated with stellar oscillations, we can ramp up the necessary parameters to fall inside our audible range, thus listening in on the music of stars, Here's an audio byte: <http://dgit.in/Stlrr>



X-57 Electric Plane

NASA's new funny looking electric X-57 plane is carrying some amazing tech on it.
<http://dgit.in/nasax57>



Venus' Electric Winds

Scientists have discovered that the electric winds on Venus stripped it of water.
<http://dgit.in/elctrowind>

5 times that space totally shocked us

Ashwin Krishnan
feedback@dgit.in

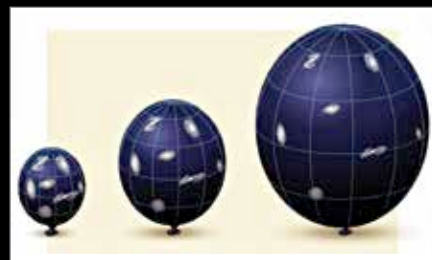
Looking up at the heavens on a moonless night, the inky blackness of the sky speckled with the few stars that light pollution still allows us to see, represents the vast depths of human ignorance. Despite the best efforts of theoretical physicists and despite what they might tell you, we are still only at the tip of the proverbial iceberg of the true nature of cosmology and astrophysics. Over the years theories have been raised, proved, rebutted, brought down and reformulated and with every successful attempt, we get a little more insight of how space works. Yet, despite this it is not the unknown that surprises us poor mortals, it is the disproving of the known, of theories that we assumed to be true; so true in fact that we often didn't even bother questioning them. Time and again, human complacency has been dealt a slap in the face by some shocking observations about space. In this article, we look at five instances where space has shocked us and given us much to ponder about.

1 The expansion of the universe

The expansion of the universe was confirmed through many astronomical observations in the early half of the 20th century. This was the period when the Big Bang hypothesis was gaining popularity, a hypothesis that stated that the universe originated from one single event, what is scientifically known as a singularity. What was surprising, however, was the observation that galaxies that are further away seem to be moving away at a faster speed. At first thought, this may seem contradictory as it seems to imply that all objects are simultaneously the centre around which the expansion occurs. This conundrum is resolved by hypothesising that it isn't galaxies as such that move away from each other, it is space itself.

and we were caught completely unawares!

To visualise this, take a balloon and draw a few dots on the surface with a pen. Now, as you blow into the balloon, you are basically simulating the same kind of expansion that happens in the universe, where the distance between the galaxies seems to increase because the balloon itself is expanding. If we trace this back, it implies that space (and consequently time) were concepts that were created at the moment of the Big Bang. Till date, this



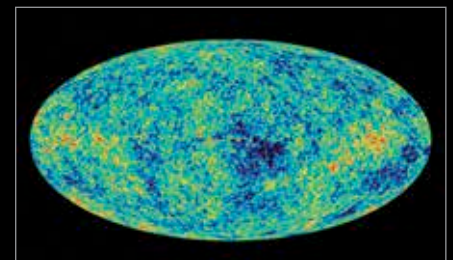
An expanding balloon showing how galaxies are moving away from each other

remains the most popular theory for the origin of the universe, but this also poses a problem as we can no longer reasonably study what happened before the Big Bang. This observation had huge impacts for cosmological models and continues to serve to remind us that the universe works in strange ways.

2 The discovery of cosmic background radiation

Around 1950, it was predicted that the entire universe is bathed in a radiation. This radiation is a remnant of the biggest cosmological event of all time: The crea-

tion of the universe itself. This radiation, called cosmic background radiation is the oldest light in the universe, dating back to the time of the recombination from Big Bang cosmology. This theoretical prediction was a massive requirement for validation of the Big Bang hypothesis. More than that, it also provides a way for us to see more in the universe, giving us a new pair of eyes with which to survey the skies. Normally, when one looks at the cosmos through a traditional telescope, the space between stars is dark. However, through a radio telescope, there is a faint glow when



A map of the cosmic background radiation in the universe

tuned to the right frequency and temperature that gives us a vast range of data that was unavailable earlier. A lot of predictions were made about the exact nature of this radiation and the properties that it would possess but the actual discovery was accidental. Working at Bell Labs in Holmdel, New Jersey, in 1964, Arno Penzias and Robert Wilson were experimenting with a 6 meter (20 ft) long, supersensitive horn antenna which was originally built to detect radio waves bounced off satellites. These radio waves they were studying were faint and required a lot of noise cancellation and a reduction of tempera-



On Mars by 2025

SpaceX may be able to have people on the Mars by 2025 says Elon Musk.
<http://dgit.in/Mrs2025>



Robot baby

Klav, the robot baby looks disturbingly realistic, and has feelings too.
<http://dgit.in/klavx1>

tures to 4K. However, their observations were different from their expectations: They saw a low, steady noise that was omnipresent and certainly not originating from our solar system. After clearing some pigeons nesting in the antenna and cleaning out the accumulated droppings, the noise remained. A friend (Bernard F. Burke, Prof. of Physics at MIT) told Penzias about a preprint paper he had seen on the possibility of finding radiation left over from an explosion at the beginning of the universe's existence by Jim Peebles. This made Penzias and Wilson realise the significance that their discovery had. The radiation detected by Penzias and Wilson and its characteristics fit exactly the radiation predicted at Princeton University by Robert H. Dicke and his colleagues. This radiation was subsequently identified as a signature of the Big Bang. For their accidental discovery and the ingenious interpretation, Penzias and Wilson were awarded the Nobel Prize in 1978.

3 Binary star systems

These are not shocking because of some obscure deviation from theory, rather these star systems are some of the most breathtaking cosmological objects in the sky. As the name indicates, these systems consist of two stars. These two stars orbit around each other, or to be more precise, they orbit around their centre of mass. From plenty of science fiction examples, we know that this leads to some extremely wonderful phenomena. If there were a planet associated with this system, one would witness two sunrises and two sunsets, one after the other. The surprising part is that the equations that govern the motion of a binary star system are extremely simple to comprehend Newton's laws of gravitation alone will give



An artistic visualisation of a binary star system

good approximations of how a binary star system works. However, for such a system to be created at all, you will need two stars of a particular mass to come close to each other with a particular velocity. Yet, there are plenty of binary star systems in the universe. In fact, the recent observation of gravitational waves at the LIGO facility in the USA was because of waves emitted by a binary black hole system, which is a binary star system where the stars have collapsed in on themselves. These systems represent some of the best artistic work that one can observe on the infinite canvas of the night sky.

4 Water on Mars

Despite the extremely vast size of the universe, there are relatively few planets that can potentially harbour human civilization. A lot of this has to do with the fact that these planets are too far away. The question then is if there are any planets close by that aren't exactly ideal for human civilization but provide enough of the basic necessities so that technology can take care of the rest. One of the most basic requirements for long-term habitation is water. Evidence of water (in the form of polar ice) is being confirmed time and again by observations as well as by tests conducted on the Martian surface by the NASA rovers that continue to roam the surface. There are also proposals to send the first team of astronauts to inhabit Mars on a trial basis. All of these point to the possibility of human civilisations on the red planet at some point in the future, a statement which, 100 years ago, would have earned the writer a one-way ticket to an asylum

5 The mysterious WOW! signal and the search for alien life

There are some facts about the universe that leave humanity both exhilarated and utterly terrified at the same time. The fact that we may, despite the nearly infinite expanse of the universe, be alone is one such example. For a long time, we have been harbouring the hope that alien life may exist, yet we found absolutely no evidence to back that hope up. However, in 1977, Earth received a strong radioband signal, a signal so strong that it was

hypothesised that it may have had an alien origin. In recent years, the speculation has died down as no further evidence has been found that the signal, nicknamed 'WOW!', had an alien origin. In 2012, a response to the signal was generated and beamed out to the galaxy. The signal, a constant pulse that the Arecibo Observatory in Puerto Rico sends out into the universe has so far seen no response. In addition to the signal sent out by the Arecibo observatory, there exist entire organisations devoted to scouring the skies for signs of life. SETI or the Search for Extra-Terrestrial Intelligence is an organization and a worldwide effort spearheaded and supported by individuals of worldwide repute such as Stephen Hawking and Yuri Milner. For many years now, SETI has been searching for life in the stars, operating under the belief that any existing civilizations out there will emit some signal of communication or at the very least, respond to the scans that SETI does with its multi-million dollar infrastructure, such as the Allen telescope array at the University of California, Berkeley. The SETI@Home project, which uses idle operating power of computers and



SETI receivers looking to the sky for any sort of life

laptops around the world to scan for extra-terrestrial life in the cosmos has returned no results either. This may possibly be because alien civilizations, if they do exist, may not be advanced enough to be able to respond, but the fact remains that it is a reasonable expectation that among the millions of planets that can hypothetically support humanoid life forms, at least one of them should respond. The very possibility that we may be truly alone, a tiny speck in this vast ocean, is about as shocking a truth as science can throw at us. Yet, SETI continues its search and all we can do is wait. And hope. ■

New vortex on Neptune.

NASA's hubble telescopes discovered a new dark vortex on the surface of Neptune. the first on the planet
<http://digit.in/vortexx1>

**Measure the universe?**

Physicists create a quantum ruler to measure the universe.
<http://digit.in/qrulerrx>

Artificial meat

Lab grown vegan alternatives

Ashwin Krishnan

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Since time immemorial, the word tofu has been met with scorns of sarcasm and looks of disapproval from regular meat eaters, who consider the substitute a poor alternative to the taste and texture of actual animal in their mouths. In a lot of ways, communities and individuals that embrace vegetarianism have always been excluded from a vast range of culinary creations which hinge on the usage of meat. For some reason, taste enhancers never quite produced the same effect of popping a whole chicken nugget and savouring the flavour that explodes in the meat eater's mouth as he bites into it. This, however, is a time of modern science, and more importantly a time of environmental consciousness. With some studies showing that giving up raising cattle for beef production can have a bigger impact on reducing our carbon footprint than giving up petrol based transportation, it is vital that we start looking for solutions. Armed with the latest in genetic science, artificial meat substitutes have sprung up in super-labs all over the world. In this article we analyse how they work and see how the staunch Brahmin can soon enjoy a steaming hot plate of mutton biriyani

What makes meat meat?

To many people, the answer would probably be taste. However, scientific experiments and taste tests from the world's leading culinary experts show that capturing the taste alone is not sufficient. It's equally important to capture the experience of biting into a piece of meat and feeling the texture as it settles on your tongue. What differentiates a hamburger from a chicken patty is not only the taste,

it depends extensively on the way the patty disintegrates.

The challenge then is to painlessly, and without harmfully impacting the environment, produce meat with the same fibrous texture in a lab. This also has varying levels of difficulty. There are some food items that have very little complex structure such as processed foods. Sausages, for example, can be grown by extracting cells or serum from cows and growing it in



Difference in texture: Chicken(left) and Beef(right)

the lab. Of course, this in itself is a tedious and complicated process that involves a lot of biotechnological wizardry but it is still something that can be done reasonably well. A steak, however, is made of muscle tissue which is threaded through with extremely long, fine capillaries which transport blood and nutrients directly to the cells. It is much more difficult to reproduce such a complex structure as the process involves not only cultivating cells but growing actual muscle fibre with the appropriate texture and flavour in the lab.

Why do we need artificial meat?

Apart from guilt free burger binging, constructing artificial meat has a hugely positive impact on the environment. There is a pressing need to reduce the environmental impact of rearing livestock; nearly 30% of the Earth's surface is covered with pastures

that are used purely to feed animals; valuable pastures that could be used to grow grain for human consumption. Almost 1,800 gallons of fresh water for drinking, feed irrigation and processing go into one pound of beef, according to National Geographic. Lab-grown food, on the other hand, requires far less land and water, and emits less greenhouse gas compared to raising livestock, according to a study by the University of Oxford. Cows and

other livestock animals produce enough methane to account for a staggering 18% of total global greenhouse gas emissions.

Above and beyond all these practicalities, it is also a scientific challenge that biohackers across the world are enthused by. Creating an entirely natural structure from scratch in a laboratory is a difficult task but the intellectual obstacles involved are the kinds that scientists love to tackle.

The science of meat making

Apart from a lot of money, a couple of degrees, a doctorate and a superlab, these are the components that you will need to grow your own artificial meat substitute

- **Starter cells:** There are two extremes in terms of choosing starter cells. Stem cells, the magic words in medical research at the moment, and differentiated muscle fibres. Stem cells are cells that haven't decided what they want

Robots refuel satellites!

NASA is making a robotic spaceship to refuel satellites, that might make refuelling much easier. <http://dgit.in/28SCsXJ>



Pluto has an ocean?

Pluto might still have an liquid or semi liquid ocean under it's icy crust. <http://dgit.in/294xPu3>

From the labs

to be yet. These are extremely quick at proliferating but are unwieldy to use because it is difficult to engineer these cells to take the structure we want. Differentiated muscle fibres have the exact texture and flavour we need but do not proliferate at all and can't, as such, be grown. A good compromise is to pick cells that are somewhere in between.

- **A growth medium:** The medium must be able to support cell growth by providing the cells with all the nutrients it required directly. Of course, ideally, you would require this medium to not be derived directly from an animal.
- **Scaffold:** This is potentially the difficult part. The scaffold is a surface that the cells can attach to. Apart from needing it to be edible so that the scaffold can become a part of the final product, it is also important that the scaffold have the same kind of texture that we require our end product to have. It is also a good idea to have a scaffold that can move in response to some kind of stimulus so that the muscle fibres attached to the scaffold can stretch and elongate as required. The scaffold along with the cells attached to it give the 3D structure that goes into the final product.
- **Bioreactor:** This is where all of the ingredients are put together and grown. There are many specific requirements that the reactor must satisfy, a high school petri dish will not suffice.

There has been different levels of success and progress in each of these categories but so far there has been no major scientific breakthroughs but scientists are, for the first time, aware of what exactly is necessary to make artificial meat a reality.



Artificially produced meat

The Dutch burger

€250,000 can buy a pretty posh house, a really fast car, or if you're Google executive Sergey Brin and the person you're giving the money to is a Dutch university, it can buy you a hamburger. Sergey Brin was pushed to sponsor this project by what he felt were erroneous ideas that people had about the meat industry. Encouraging people to not eat meat is not a viable option as the tendency to eat meat is 'ingrained deep in our evolution', according to Prof Wrangham, primatologist from Harvard University. With such severe constraints, growing artificial meat is a pressing need of our time and Brin is one of the first people to recognise this.

The most expensive hamburger in the world was a three month long project headed by Dr Mark Post at Maastricht University that began with the extraction of stem cells from two cows, a blanc-blue belge and a blond acquitaine. Dr Mark Post and his team at Maastricht University used these cells to grow 20,000 muscle fibres in individual culture wells, each one a tiny hoop of greyish-white protein suspended in a gel-like growth medium that contained antibiotics and a serum extracted from cow foetuses. The cells were allowed to grow for a few weeks to gain some size. After this, each fibre was removed individually, cut open and straightened out in a long string. These fibres form the base of the final patty. Compressed together, these fibres are then coloured with beetroot juice to give it the colour of ground beef, mixed with saffron, breadcrumbs and a few other ingredients to bind it together. "It's really just proof of concept right now, we're trying to create the first cultured beef hamburger," said Brin in a film to mark the tasting event in London on Monday. "From there I'm optimistic that we can really scale by leaps and bounds."

This burger however, is pure protein and has no fats, a fact that has not escaped the notice of tasters. "The texture, the mouthfeel has a feel like meat," journalist Schonwald put it. "The absence is ... fat. It's a leanness. But the bite feels like a conventional hamburger. It's kind of an unnatural experience" The next test therefore, for Post and his team, is to incor-

porate fat and to reduce costs. There has been huge progress in the past couple of years with the team able to reduce to cost to \$12 per patty. This is still quite expensive but at least the price is on the same scale as conventional burgers.

Other lab grown vegan wonders

Substitutes are being created for virtually all animal based products. One of the most interesting projects in this endeavour is titled Real Vegan Cheese, a group of biohackers that are looking to create milk, and consequently all dairy based products such as cheese and butter, directly from DNA of cow's milk protein. One day, they hope to achieve the proficiency to be able to make complicated cheeses from one DNA extract.




The final burger. Not quite a whopper yet

The lab-grown-food sector is growing quickly. Along with Brin, other big-name backers include Microsoft co-founder Bill Gates and PayPal co-founder Peter Thiel.

"The global food supply chain is a multitrillion-dollar industry," says Arvind Gupta, founder of IndieBio, an accelerator that exclusively funds synthetic-biology startups. "That's the market we're thinking about disrupting."

The future

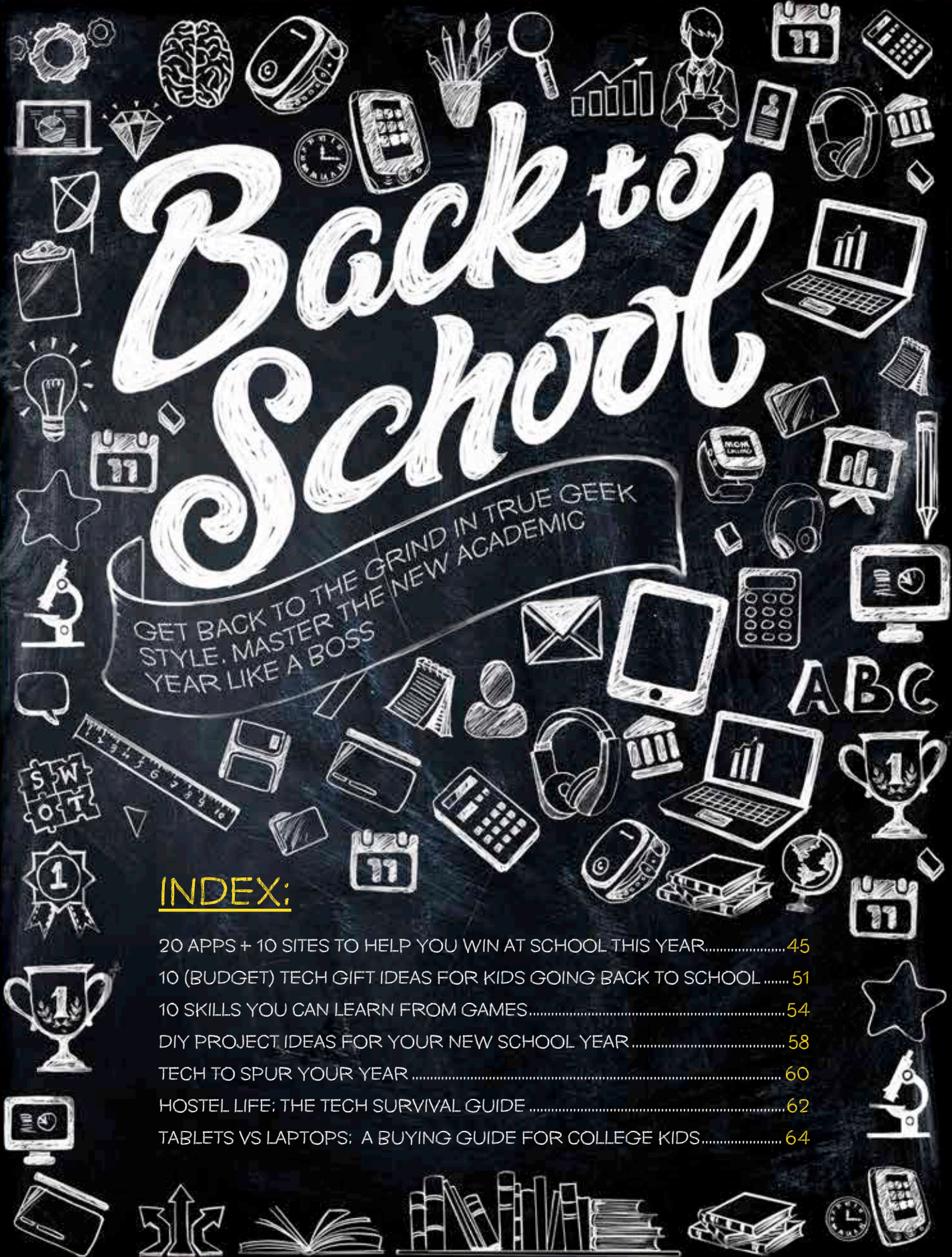
There is a lot of scope and funding for lab grown animal product substitutes. Despite a few criticisms, notably from activists who worry about the impact that this may have on livestock farmers, the industry is one that is set to witness breakthrough progress in the next few years. The day may not be far when a Maharaja Mac is grown in a lab and we'd be none the wiser. 

Back to School

GET BACK TO THE GRIND IN TRUE GEEK STYLE. MASTER THE NEW ACADEMIC YEAR LIKE A BOSS

INDEX:

20 APPS + 10 SITES TO HELP YOU WIN AT SCHOOL THIS YEAR.....	45
10 (BUDGET) TECH GIFT IDEAS FOR KIDS GOING BACK TO SCHOOL	51
10 SKILLS YOU CAN LEARN FROM GAMES.....	54
DIY PROJECT IDEAS FOR YOUR NEW SCHOOL YEAR.....	58
TECH TO SPUR YOUR YEAR	60
HOSTEL LIFE: THE TECH SURVIVAL GUIDE	62
TABLETS VS LAPTOPS: A BUYING GUIDE FOR COLLEGE KIDS.....	64





It's the start of another school year, which means you'll soon find yourself facing an onslaught of tests, assignments and projects! To aid your academic campaign, we've compiled a list of desktop, web and smartphone apps that will give you a head start – whether it's planning a study group, managing your timetable or creating study aids.

TOP 10 WEBSITES

1 **WRITEWELL**
(<http://writewellapp.com>)

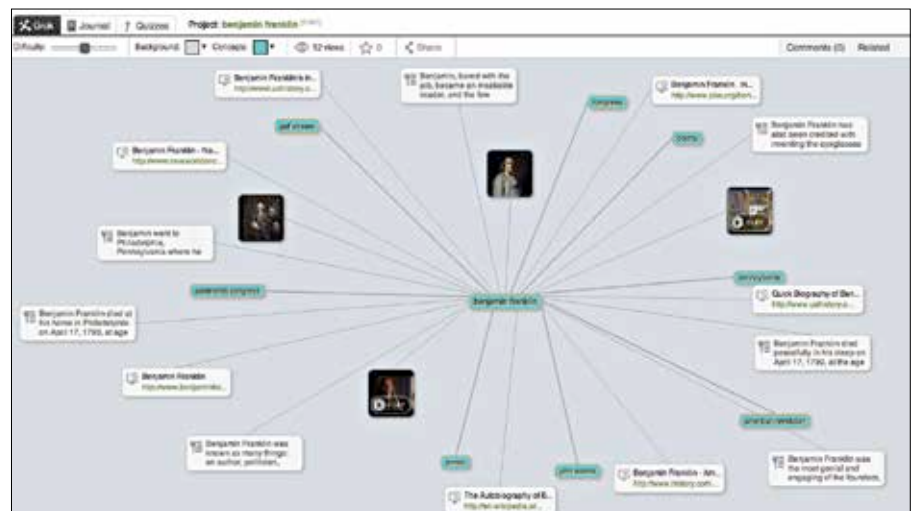
The hardest part of writing an essay or a research paper is getting started – and staring at a blank page isn't going to make the task any easier. Writewell is an all-in-one writing aid, that helps you get started by providing templates for academic papers, lab reports, essays, cover letters and more. These templates contain a number of chunks with a prompt to help you get started, and you can rearrange these chunks to suit your writing. You can also add your sources to the app, including other papers, links or audio clips, and Writewell will automatically generate a source list and append it to

your work. Once you're done, you can export your work as a Word document, a PDF file or upload it to Google Drive.

2 **INSTAGROK**
(<http://www.instagrok.com>)

The most common way to start researching a new topic is to Google it, which will probably lead you to a Wikipedia page. While this approach isn't

inherently bad, the barrage of information can be quite overwhelming if you're trying to grasp a new concept for the first time. Instagrok presents information in the form of a handy 'concept map', showing you key concepts and their underlying relationships, helping you grok (nerd speak for understand) the material better. It also provides related links to educational videos hosted on sites like Khan-

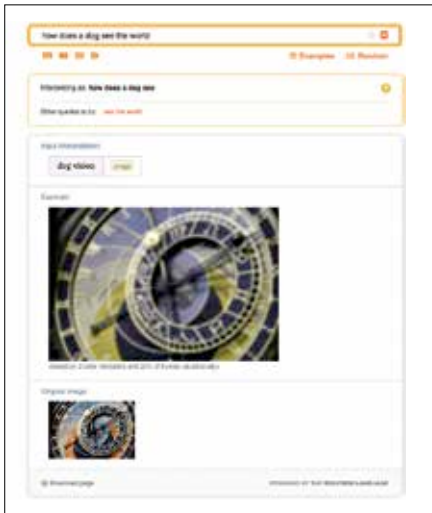


Instagrok helps you visualize new information, and can be a great research tool

Academy, should you wish to explore the subject further. The premium version features a Teacher Dashboard – a place where teachers can create assignments for students and monitor their progress.

3 WOLFRAM ALPHA (<https://www.wolframalpha.com>)

You've probably heard of Wolfram Alpha and dismissed it as an imitation of Google, but it serves a very different, very awesome purpose. The 'Computational Knowledge Engine' is a service that takes in a natural language query and spits out



Wolfram Alpha can return some interesting results for your whimsical queries

a factual answer, crunching data from numerous sources along the way. The answers include graphical data, statistical information, mathematical computation and more. Want to find out how your dog sees the world? Just enter the query and you'll be presented with two images – a regular one as perceived by humans, and a slightly blurry one corresponding to canine vision. Other cool uses include finding the Scrabble score for a given word, interpreting the nutrition label on foods, analysing your social circle from your Facebook data, and even finding out if you're too drunk to drive. (Though if you have to ask, you're probably better off calling a cab)

4 OPENSTUDY (<http://openstudy.com>)

Study groups are a great idea, but only if you can manage to keep the

banter to a minimum and focus on getting work done. They can accelerate learning and foster creativity by means of discussions with your peers, which also makes it easy to get help on topics that might be difficult to grasp. However, the logistics of forming such a group may be complex unless you happen to live on campus. OpenStudy is a great option that lets you form online study groups with students all over the world for a variety of subjects. These groups also have Qualified Helpers – members who are certified to be experts in their domain and who'll be happy to lend you a hand. You can also sign up to become such a Helper if you're confident about your knowledge and like explaining intricate concepts to your fellow students.

5 PLAGIARISM CHECKER (<http://www.plagtracker.com/>)

As a student, one of the worst blunders you can make is to turn in an assignment or paper that contains plagiarised content. Most professors will employ sophisticated anti-plagiarism tools to scan your work, checking for any non-original content. It's usually a good idea to run your work through a tool such as PlagTracker, which lets you upload your document and sends you a plagiarism report. If you just want to scan a short piece of text instead of an entire document, <http://smallseotools.com/plagiarism-checker/> lets you paste some text into a text box and check it for originality. Of course, you might get a few false positives, but better be safe than sorry.

6 SHIKSHA (<http://www.shiksha.com>)

Choosing a college after graduating from high school can be a daunting task – there are several factors that go into the decision, not to mention the dozens of entrance exams and application deadlines one needs to be aware of. Finding this information isn't always easy, and college websites are often outdated or difficult to navigate. Shiksha is a one-stop shop for all your college and career related queries, with updated information on more than 14,000 colleges and 40,000 courses. You

can access college rankings and college reviews across streams like Engineering, Law, Management, Medicine, Hospitality, Retail, Media, Finance and more. Additionally, the site has details about application deadlines, fee structures, qualifying exams required and in the case of MBA programs, even lets you contact current students with your queries.

7 MATHWAY (<https://mathway.com>)

If you grew up fearing Math like the apocalypse and still wince at the thought of solving Math problems, fear not – the Internet's got your back. Mathway is a very powerful tool that takes the pain out of doing math by solving problems from fields like Calculus, Trigonometry, Statistics, Algebra, Geometry and even Chemistry. It also comes with an easy-to-use graphing calculator, letting you plot different types of curves to get a better understanding of the behaviour of different kinds of functions. If you upgrade to the pro account, you'll also get detailed, step-by-step solutions to your problem, doubling up as a study-aid. It's also a handy tool if you're majoring in Physics or Engineering and would rather outsource your computational heavy lifting so you can focus on the task at hand.

8 PIXLR PHOTO EDITOR (<https://pixlr.com/editor>)

While photo-editing is a category that probably warrants its own list of apps, it's quite unlikely that you need access to a full blown editor like Adobe Photoshop. It's expensive, it's resource-hungry, and chances are, your photo editing needs can be easily met by a free webapp like Pixlr Editor. You can easily use it to perform basic image editing –



Pixlr Editor is a powerful, browser-based photo editor

crop and resize photos, adjust brightness and contrast, remove red-eye in pictures and even use the sharpen or blur tool to create interesting graphics for your projects and presentations. The interface is quite standard, so anyone who's used Photoshop or similar software should feel right at home. Pixlr uses Flash though, so if you need a Flash-free alternative, check out the Photobucket Editor (<http://photobucket.com/editor>)

9 SPARKNOTES (<http://www.sparknotes.com>)

We've all been there – it's the night before your English Literature final, and thanks to weeks of procrastination, you haven't gotten past Chapter 1 of *To Kill A Mockingbird*. Instead of giving up entirely and resigning yourself to a failing grade, fire up the study guide on Sparknotes. The site contains detailed guides, analyses, plot overviews and chapter-wise summaries of most literary works, including novels, poems and Shakespearean plays. While it's best used as a last-minute revision tool, most students have come to recognise it as a substitute for actually reading the assigned texts. (We don't recommend this approach). The subject matter is well organised and easy to understand, but make sure you don't directly lift sentences from the site on your term paper, or you'll find yourself on the wrong side of a plagiarism detector.

10 MOOC AGGREGATORS (<https://www.class-central.com>, www.redhoop.org)

The last few years have made education more accessible than ever – no matter what you're looking to learn, there's a good chance it's being offered as an online course that you can take from the comfort of your couch. Coursera, edX, Udacity and Udemy have, between them, thousands of courses covering everything from literature to design, public policy to engineering. However, finding the right course for your need can be quite a task – a task best left to an MOOC aggregator such as Class Central or RedHoop. These sites function as search engines for online courses, letting you filter by subject, language, cost, duration and whether or not you'll be awarded a certificate at the end of your course.

TOP 10 APPS

1 WUNDERLIST

To-do list apps are a dime-a-dozen, which makes it imperative that you choose one and use it diligently. Making lists and reminders will help you keep track of your academic and personal lives, ensuring that you're caught up with your classes, assignments and deadlines. Wunderlist has been around for a long time, and its seamless syncing, cross-platform nature (it is available on Windows, Mac, iOS, Android, Windows Phone and the web) and the ability to set recurring reminders make it our to-do list app of choice. You can make as many lists as you like, add due dates, reminders and attach files to each item and even add tasks via email (just forward the email to me@wunderlist.com to add it to your list) The pro version allows for collaborative features such as shared lists, comments and the ability to delegate tasks. Of course, Wunderlist isn't the only app out there – Tick Tick, Todoist and Any.Do are some great alternatives worth checking out.

Android: http://dgit.in/Wunderlist_AndroidApp
iOS: http://dgit.in/Wunderlist_iOSApp
WP: http://dgit.in/Wunderlist_WindowsApp

2 QUIZLET

Smartphones are perfect for reviewing your study notes before a quiz or an exam, and flashcards are a powerful learning tool to that effect. A flashcard contains a word, question or a phrase on one side, and an explanation, definition or formula on the reverse side. Repeatedly going over a stack of such flashcards can be a very effective memorisation or revision tool. Quizlet is one such flashcard app, available on both iOS and Android that boasts a neat interface and a huge library of over a million sets of flashcards, along with the ability to make your own. Quizlet employs 'spaced memorisation' – showing you those cards that you got wrong more frequently than others. Teachers can use the webapp to make interactive games and practice tests via a feature called Quizlet Live. Other notable alternatives to Quizlet are StudyBlue (Android/iOS), Anki Droid (Android) and Chegg Flashcards (iOS).

Android: http://dgit.in/Quizlet_Android
iOS: <http://dgit.in/QuizletiOS>
WP: <http://dgit.in/QuizletWindows>

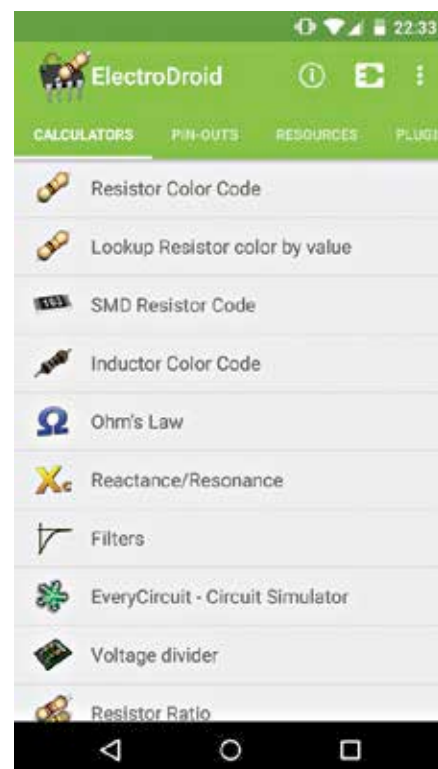
3 CLASS TIMETABLE (IOS) / STUDIOUS (ANDROID)

Managing your academic calendar, exams, homework assignments and projects can be a daunting task and it's all too easy to get bogged down under the weight of your course load. Class Timetable on iOS and Studios on Android are two great apps to help manage your schedule – just enter your classes and timings, and the app will generate a timetable-style view, where you can enter details of upcoming quizzes and assignments and even get reminders when they're due. Studios will even save you some embarrassment by silencing your phone when you're in a class. Additionally, Class Timetable lets you review the day's schedule at a glance using the companion app for the Apple Watch.

Android: http://dgit.in/Studios_Android
iOS: http://dgit.in/ClassTimetable_iOS

4 ELECTRONICS REFERENCE APPS

For students of engineering, working with electrical equipment in the lab involves a lot of looking up of numbers, figures and colours. Luckily, apps like Electronics Engineering ToolKit



Electrodroid is a handy reference for electronics enthusiasts

for iOS and Electrodroid for Android provide a handy, pocket reference for things like resistor and inductor colour codes, calculators for voltage drops, low and high pass filters and frequency and decibel converters. Both apps pack close to a hundred small utilities which can save you a lot of time when you're working on your next project in the electronics lab.

Android: http://dgit.in/Electrodroid_Android
iOS: http://dgit.in/Electronics_iOS

5 GENIUS SCAN / CAMSCANNER

As a student, you're going to end up missing a few classes – and instead of running around trying to photocopy notes from your classmates, use your smartphone to create a high quality scan of your lecture notes that you can save as a PDF. Genius Scan and CamScanner are two such apps that use your phone's camera to snap a picture of a document, a whiteboard, paper receipts and more, and convert them into a clear, sharp document or photo that can be viewed later. You can automatically have your documents uploaded to Dropbox or Google Drive, and the Pro version of CamScanner also comes with OCR (Optical Character Recognition), making your handwritten text instantly searchable. Windows Phone users have Microsoft's own Office Lens app, that integrates well with other apps like OneNote and Word.

Android: http://dgit.in/Genius_Android
iOS: http://dgit.in/Genius_iOS
WP: http://dgit.in/Lens_Windows

6 QUICK GRAPH (IOS) / DESMOS GRAPHING CALCULATOR (ANDROID)

Graphing calculators are great tools to help you quickly visualise the behaviour of a function, solve complicated equations and interpret inequalities. Quick Graph on iOS and Desmos Graphing Calculator on Android are two apps that do just that. You can enter functions in two and three dimensions and have them plotted for you, switch between cartesian and polar co-ordinates and even find the roots of an equation easily. Additionally, Desmos also has a curve fitting feature, where you can enter a set of points and find the equation for a curve that most

closely resembles your experimental data. You can slide your finger along a plotted line to find points of interest such as local maxima/minima and points of intersection with other curves.

Android: http://dgit.in/Desmos_Android
iOS: http://dgit.in/QuickGraph_iOS

7 FLIPBOARD / FEEDLY

While RSS as a format for received feeds from websites has waned in popularity (thanks to Google), getting your news from multiple websites has never been easier. There are dozens of services out there. Feedly and Flipboard are among the more popular feed readers, and with good reason. Feedly tries to mimic traditional RSS aggregators by sorting your feeds into folders. Almost any website can be added to your list, and Feedly offers a number of display options – from a newspaper style view with lots of images or a more traditional, text-heavy format like Google Reader. Flipboard, on the other hand, adopts a magazine-style approach and can show you content from your Instagram or Twitter feeds too. You can't directly enter a website's URL like you can in Feedly, but Flipboard has a vast selection of curated content, allows you to create your own customised magazine, and even lets you follow interesting people to see what they're sharing.

Android: http://dgit.in/Feedly_AndroidApp
iOS: http://dgit.in/Feedly_iOS

8 POCKET / INSTAPAPER

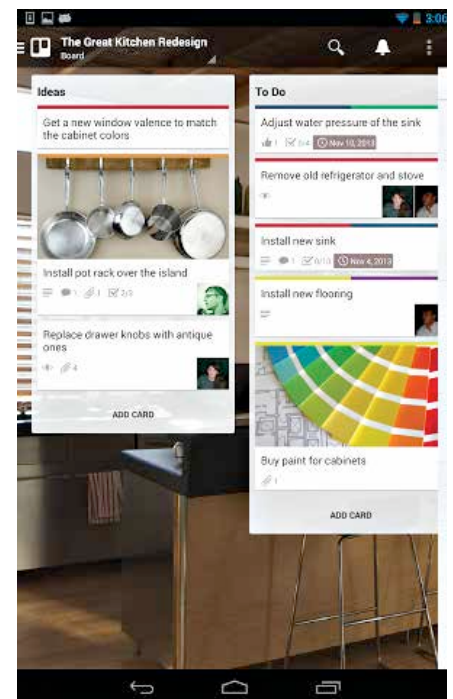
Read-it-later apps are perfect for the procrastinator in us all, because it's truly impossible to keep up with all the interesting stuff you find on the web. Pocket and Instapaper are among the popular apps that let you save web pages for later using a browser extension. These articles can then be accessed later from your mobile device at your convenience, and the app will strip out all formatting, ads and links to give you a clean, almost book-like reading experience. Both apps allow for organising your articles into folders (Instapaper) or tags (Pocket), and both apps have a 'Recommended' section where they scour out interesting content from all over the web. They're perfect for reading longform-style articles when you're commuting, waiting in a queue or just trying to kill

time. Windows Phone users needn't fret though, because Poki is an excellent third-party Pocket client that lets you access your saved articles offline.

Android: http://dgit.in/Pocket_Android_App
iOS: http://dgit.in/Pocket_iOS_App
WP: http://dgit.in/Poki_Windows

9 TRELLO

During your time in school or college, you'll probably be required to work in a team for a group project or assignment. Co-ordinating tasks, documents and deadlines over email can be a pain – you'll end up



As far as project management apps go, it's hard to beat Trello

with a lot of long and unwieldy email threads. Instead, use a project management app like Trello that'll ensure that everyone's on the same page (both literally and metaphorically). Trello is based on lists – you can create a list for your to-dos, for brainstorming, to keep track of completed subtasks etc. Each list can contain items with text, images, documents and due dates, and you'll receive notifications when a teammate updates an item. The Trello for Business upgrade will allow you to connect to external services such as Github, Evernote and Google Drive.

Android: http://dgit.in/Trello_Android
iOS: http://dgit.in/Trello_iOS

10 SWORKIT

As a student, it's easy to neglect your health, what with the stress of exams, deadlines and placements. But it's not that hard to stay fit – You don't even need access to fitness equipment or a gym – use an app like Sworkit that'll give you personalised workouts that you can do at home. Just select the type of workout you're looking for (cardio, stretching, yoga, strength training etc.) and the amount of time you have available, and Sworkit will suggest the right workout, with proper instructions and a demo video. The Premium version has access to some exclusive features such as custom timer values, interactions with a real fitness trainer and special workouts for beginners or older people.

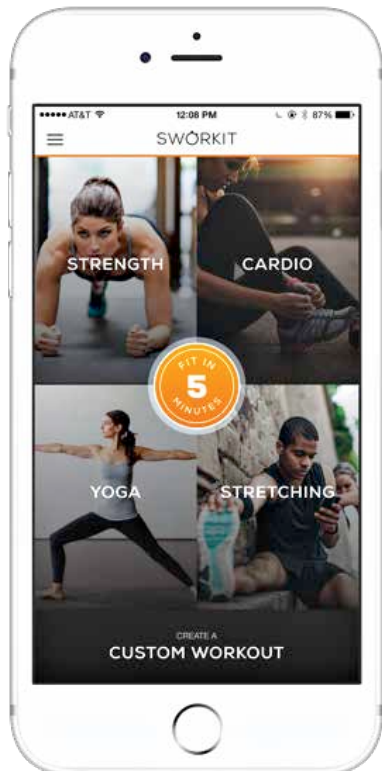
Android: <http://dgit.in/SworkitAndroid>

iOS: <http://dgit.in/SworkitiOS>

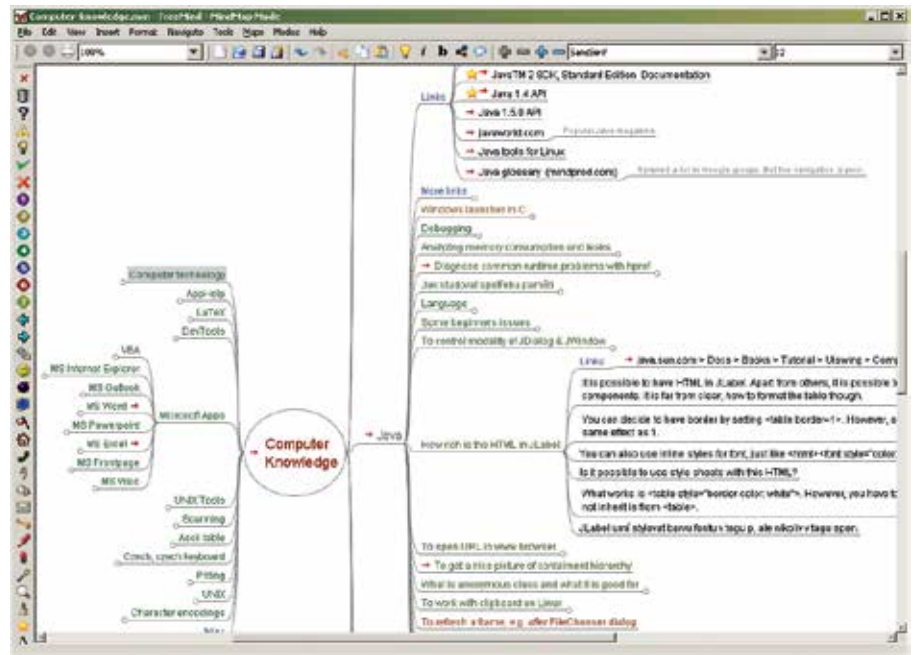
TOP 10 DESKTOP APPS

1 FREEMIND

Studying is hard work, and there's no getting around it if you're a student. Mind maps are a great study tool that can help you organise and memorise new information quickly. They are essentially a visual representation of information centered around a single con-



Sworkit offers customized workout to match your busy schedule



Freemind is great tool for creating rich, detailed mind maps.

cept. Freemind is a full-fledged, Java based application that runs on Windows, Mac and Linux systems, and lets you create, edit and publish mind maps. You can add branches and subtrees, attach photos and use different colours to signify different levels of importance. These mind maps can then be saved in PNG or PDF formats.

Mac: http://dgit.in/Freemind_Mac

Windows: http://dgit.in/Freemind_Windows

Linux: http://dgit.in/Freemind_Linux

2 EVERNOTE / ONENOTE

Taking notes is an integral part of the learning process. Whether you prefer taking notes by hand or on a computer, you can't go wrong with a robust note-taking app like Evernote or OneNote. Both apps are free, and let you take notes with images, audio and document attachments. You can organise your notes into distinct Notebooks, and the app will sync your notes across its Android, iOS, Windows Phone and web apps. Both have strong integration with cloud storage services: OneNote lets you save notes into OneDrive, while Evernote can import files from Google Drive. A browser extension allows you to clip any webpage into your notebook for future reference, and powerful OCR functionality lets you search text from within images and scanned documents. Also, Simplenote is an excellent plain-text note taking tool with support for Markdown notes.

Windows: http://dgit.in/Evernote_Download

Mac: http://dgit.in/Evernote_Download

Windows (OneNote): http://dgit.in/OneNote_Windows

Mac (OneNote): http://dgit.in/OneNote_Mac

3 MENDELEY

One of the most important skills you'll pick up in college is the ability to do independent research. Mendeley is a tool that helps you manage all of that research. It collects all of your papers, references and notes in one place, where you can search, highlight and annotate your sources. Generating references is also easy, and Mendeley will provide you with a citation in any format you like, compatible with Microsoft Word and LaTeX. You can also create groups to share your reading lists or collaboratively work on writing research papers. Furthermore, the app also lets you follow your friends and colleagues and share your published papers with your followers

Windows: http://dgit.in/Mendeley_Windows

Mac: http://dgit.in/Mendeley_WindowsApp

Linux: http://dgit.in/Mendeley_Linux

4 DROPBOX

Cloud storage is a space that's been commoditised by the likes of Google, Microsoft and Apple, but Dropbox is still our choice of file syncing and cloud storage on the desktop. It's the only app that's

available on Linux, and while it only provides 2GB of free space, it's also the fastest at syncing files. Dropbox's algorithm intelligently determines files that have been changed, and only syncs that changed portion of the files. It can also auto-save your screenshots, and will offer to backup your photos if you plug-in a digital camera to your computer. You can generate a shareable link for any file in your Dropbox folder from your file explorer, and if you accidentally delete an important file, you can always restore it from the web interface. An upcoming feature in Dropbox for Windows and Mac will now allow you to download files on-demand, so you can view the entirety of your Dropbox folder without having the files take up disk space. Among the alternatives, Google Drive is a great alternative if you edit a lot of documents, while OneDrive and iCloud Drive come pre-installed with Windows and Mac computers respectively.

Windows: http://dgit.in/Download_Dropbox

Mac: http://dgit.in/Download_Dropbox

Linux: http://dgit.in/Download_Dropbox

5 F.LUX

Life in college is synonymous with late nights – whether you're prepping for a final or just binge-watching the latest season of *Game of Thrones*, you're going to spend large amounts of time staring at your computer screen. F.lux is an app that minimises eye strain by changing the colour temperature of your display, making the colours warmer after sunset. It automatically fetches the sunset and sunrise time based on your location (or you can enter a time manually) and gradually changes the colour of your display as the evening progresses. There's also an option to disable it temporarily for an hour, until the next sunrise, or for a specific app if you're doing colour sensitive work such as editing photos or video.

Windows: http://dgit.in/Flux_Windows

Mac: http://dgit.in/Flux_Mac

6 ICE CREAM APPS

Working with PDF documents can be a pain – especially if you're trying to split or merge multiple PDF files, or are trying to convert a PDF to another format like a .doc or a .xls.



F.lux will change the colour of your computer's display to match the time of the day.

Ice Cream Apps are a free suite of small utilities that let you work with documents such as PDFs, photos, e-books and presentations for when you don't have access to a copy of Microsoft Office. The six utilities provided allow you to merge and split PDFs, convert to and from the PDF format, create slideshows, view ebooks, convert and resize images or create a screencast. The free versions of these apps come with a few limitations, but we reckon they're good enough for most, though you can always upgrade to the Pro version if you need the extra power.

Windows: <http://dgit.in/IceCreamApps>

Mac: <http://dgit.in/IceCreamApps>

7 MICROSOFT OFFICE / GOOGLE DOCS

While Office apps are definitely great, they're expensive (unless your college offers them through the Office 365 for Education program) and for most document editing needs, might be overkill. Google Docs are a great and free alternative that should work for most of your college assignments, presentations and reports, with the added advantage of being always in sync on all of your devices. The collaborative editing and revision history make it a great tool for teams (We at *Digit* use Google Docs religiously) and you can even use them offline on Google Chrome. Having said that, Microsoft Office is the industry standard, and some of the more advanced features offered by it give you fine-grained control over your documents, which may be absent on Google's free offering.

Google Docs: <http://dgit.in/dgtGoogleDocs>

Office for Windows: <http://dgit.in/dgtOfficeForWindows>

Office for Mac: <http://dgit.in/dgtOfficeForMac>

8 GINGER

You'll be surprised by the number of grammar and spelling errors that sneak into your writing, even if you're a seasoned writer. Ginger is a tool that helps improve your writing while also proofreading your text along the way. Available as a browser extension for Google Chrome, Safari or a Windows app, it will not only correct any grammar and spelling mistakes, but also suggest better ways of rephrasing your sentences. The Pro version will also analyse your errors and help you improve by giving you practice writing sets.

Google Chrome: <http://dgit.in/GingrDwn>

Windows: <http://dgit.in/GingerDownload>

9 STUDYMINDER

Managing your academic life in college can be hard, especially if it's chock full of classes, labs, assignments and quizzes. Traditional calendars can, at best, track your timetable, but that leaves your assignments and homework out in the cold. StudyMinder for Windows is a complete student planner that keeps track of your schedule, with reminders for important events like tests and deadlines. You can enter your homework assignments into the app and it will suggest a block of time based on your calendar. It also gives you an overview of your grades and GPA.

Windows: <http://dgit.in/StudyMinder>

10 COLD TURKEY

If you need to use a computer for your assignments and homework, then rest-assured, you're going to get distracted at some point of time. Cold Turkey is a tool that lets you block websites such as Facebook, Reddit or Netflix for a set amount of time, making it almost impossible to circumvent the block. You can't kill the program via a task manager or even uninstall it while you're supposed to be studying. The Pro version lets you block applications on your computer and even comes with a feature called 'Frozen Turkey' which completely shuts out the internet.

Windows: <http://dgit.in/CTurkeyWin>

GADGETS ON A BUDGET

10 GADGET IDEAS TO SOLVE EVERYDAY NIGGLES
FOR CASH-STRAPPED STUDENTS

SIDDHARTH PARWATAY

editor@digit.in

If there's one thing students will agree on universally, it's how cash strapped they all are. Students are perennially looking for the cheapest alternative to get the job done. Sure, quality matters, but sometimes price matters even more, and for those times there's nothing quite like finding the perfect *jugaad*. In this part of the cover story we'll give you our list of 10 best gadgets that will help you win this year.

1 LAPTOP LOCK CABLE
You got yourself a shiny new laptop and you couldn't be happier. You are by yourself in the library busily hammering away that submission which is due the next day. Suddenly nature calls, as it always does, when you least expect it. You say to yourself you won't be long and pop out to do your business. When you return *gasp* your laptop's gone! Now you could've asked someone to keep an eye on it while you are away and while it might've worked when you are in the library, but certainly not in your canteen or common room. For these very situations it's best to get one of these Kensington lock cables. The one we have suggested here is slightly longer than most of the listings out there. While the specs list it at 1 meter some of the user reviews say it's longer – because, you know, length matters!

Buy: <http://dgit.in/Laplok> (₹250)



2 CHEAP HDMI STREAMER
Access to screens isn't very difficult these days. In fact, many hostel roommates might even chip in for a 32-inch TV. Though you could always connect your laptop directly to the TV, but it tends to get cumbersome in the long run. A simpler solution is to get one of these Smart TV dongles or HDMI streamers. The one featured here – EZCast – can even access folder structures on an HDD that's connected to your network and play files off it! You can use your laptop to trigger any file you can access. You can even stream YouTube videos from your phone. Quite a nifty thing to have around for those short (or long) study breaks. Plus, it's certainly cheaper than a Chromecast!

Buy: <http://dgit.in/CHEzCast> (₹1,395)



3 DEDICATED VOICE RECORDER
 You can't always rely on the benevolence of the resident first bench note-taker. Bribing him or her can be pretty expensive. Besides, some lectures are really so good, or so confusing, that you need to listen to them again. Why not use a phone? You certainly wouldn't want to leave your phone in the front row, unattended, while you sit somewhere else. Plus, there's no way your phone can give you 15 hrs of recording time. This voice recorder can, and it's even camouflaged to look like an ordinary pen drive. You can just place it somewhere close to your professor and then snooze away... err... we mean listen intently without worrying about taking notes... This M Supervision VM-22 4 GB Voice Recorder is small and light, and you just plug it into your computer, and then copy the audio files off it, like you would from a pen drive.

Buy: <http://dgjit.in/MVoiceR> (₹800)

4 LAPTOP BAG / CASE
 With Laptop bags either you can invest in something like a Samsonite or American Tourister and have it last really long, or you can go in for cheaper alternatives that you can keep changing about once a year. The advantage of the latter approach is that you seem to have a new bag every now and then, plus it doesn't hurt your pocket to shell our big bucks in one shot and then have to live off scraps from others. This HP Laptop bag should be large enough to fit a 15-inch laptop:

Buy: <http://dgjit.in/HP15Bag> (₹550)

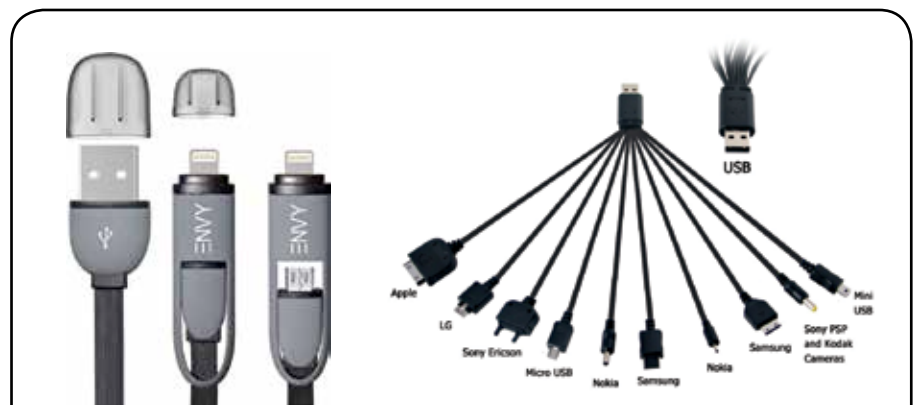
If you already have a shoulder bag and are just looking for a sleeve you should consider the AmazonBasics 13.3-Inch Laptop Sleeve

Buy: <http://dgjit.in/AmznSlv> (₹799)



5 BLUETOOTH SPEAKER
 Whether you want some background music for your study time or you want to listen to that audio book you just downloaded on your phone; a Bluetooth speaker is an invaluable enhancement to the tiny speakers on your phone. The Logitech X100 is a value for money purchase and will give far better quality and durability than other no-name brands. With 5 hours battery life, it's more than enough. Besides, the aux-in can let you enhance your laptop output as well if your laptop speakers aren't loud enough.

Buy: <http://dgjit.in/LogiBlue> (₹1,583)



6 ALL IN ONE CABLES
 With USB Type-C and Lightning ports becoming increasingly ubiquitous, these all-in-one cables might start to seem like remnants of a bygone era. Though we shouldn't be ringing their death-knell just yet. With so many of our legacy gadgets like Handicams still running

on mini USB (not even micro) such cables are quite useful to have around
 Buy: <http://dgjit.in/10in1Chgr> (₹159)

If you think having the Nokia and Sony proprietary pins is a bit much, consider this other Envy 2 in 1 USB/ Data Cable. It has a Micro / Lightning adapter for iOS and Android phones.
 Buy: <http://dgjit.in/Envy2in1> (₹279)



7 USB HUB / CHARGER

If you are living in a dorm or shared hostel room chances are there will likely be a daily fight over who gets to charge their phone (and other gadgets) from the one lone charging point. Leave all those squabbles behind and go for this 6 port hub from Portronics. It distributes 8 Amps among 6 ports, which isn't all that great for quick-charge but it's good enough.

Buy: <http://dgit.in/UFOChrg> (₹722)



If you can convince your buddies to chip in, then go for the superior Aukey Quick Charge 2.0 5 Port charger for ₹1,899. It features a Qualcomm certified Quick Charge port and 4 Ai Power Smart Charging USB Ports which deliver up to 2.4A even when all ports are used simultaneously

Buy: <http://dgit.in/AukeyQk>

If the 5 port Aukey is too expensive for you, there's a variant with 2 Ai and 1 Qualcomm port for ₹1,199

Buy: <http://dgit.in/Aukey2>

8 PENDRIVE

There can never be too many pendrives. Especially if you have quite a few friends who keep borrowing them for 'movies'. So the next time you need another one and don't find any lying around, don't go for an impulse buy. Get one pendrive that you will never share with anyone and guard it with your life. And from our experience we haven't ever had a SanDisk Cruzer Blade fail on us ever. It's pretty reliable and for ₹400 for 16GB it's a pretty value for money purchase.

Buy: <http://dgit.in/CruzerSD> (₹400)



9 TRAVEL ADAPTER

Even if you don't travel around much this travel adapter is a handy device to have around. If you decide to have someone get you a gadget from abroad, dealing with those godforsaken flat pins is a pain. If you are starting a school year abroad this is something you definitely need, at least initially.

Buy: <http://dgit.in/TrvlAdap> (₹130)

Though remember this is a clunky product. You'll probably have to prop it up with supports because the pins won't have enough of contact / friction to keep the adapter in place when you put in some heavy plugs. If you have a bit of money to spare go for the more expensive Targus APK01AP-52 World Power Travel Adapter:

Buy: <http://dgit.in/TrgsTrvl> (₹799)



10 USB LIGHT

Violating your hostel warden's lights out orders? Want to be prepared for power cuts? Having an outdoor camping trip? Just want to light up your keyboard for a little incognito surfing? Did your hostel electricity give up on you right when you had to work on that project that is due tomorrow? No point in waiting for the light to shine upon you. We recommend going for USB powered lights that are both easy to maintain and power. With the abundance of USB ports and growing use of power-banks, these USB lights won't ever have a dearth of power sources. And they fit into your pocket!

Buy: <http://dgit.in/USBLght> (₹157)



10 SKILLS YOU CAN LEARN FROM GAMES

THAT WILL ACTUALLY HELP YOU...
IN LIFE, COLLEGE, SCHOOL, ETC

MANISH RAJESH
feedback@digit.in

The reason you're going to immediately start reading this story is because you want to see if it's something you can show to your parents in order to get them to buy you a gaming rig, or to upgrade your existing one. Plus, you probably think this might get them off your back when you want to play games instead of doing chores... good luck with that. If your parents are frowning on your video gaming it probably has something to do with the way your life is going.

This article is not trying to justify your gaming binges, or validate your bias towards gaming, or even tell your parents off for being so old school in their beliefs. This is a factual article that aims to take a look at some of the benefits of gaming in moderation, and we want to specify: in moderation! There's a good reason parents try and regulate your gaming – it's because it's so darn addictive, and it makes it so easy for us to procrastinate. However, you have to do it in moderation, or else it can cause serious problems. We should know... if we didn't have an internal regulator that told us when we were going

too far, you'd never get to read another Digit magazine again because we'd all be passed out at our desks from exhaustion after playing games for days on end.

Enough preaching, however, because what this article will do from now on is focus on the several benefits that gaming can have for an individual, and how it can enhance your skills, or even give you all new skills that you couldn't learn anywhere else!

1 PROBLEM SOLVING SKILLS AND LOGIC

Even when you're playing games such as *Angry Birds*, or *Cut the Rope*, and especially when playing complex puzzlers like the *Portal* series, you're basically training your brain to think logically in order to solve the puzzles. Not only are you indulging in problem solving



and using the logic centres of your brain, you're being forced to do it within a time limit. This translates to a very real-world skill that you will often put to use at work.

One of the things many new recruits into the workforce struggle with is lateral thinking (thinking outside the box), and thinking fast, and on the job. Games certainly seem to help in that aspect.

2 FOLLOWING INSTRUCTIONS

This may seem like not a big deal at first, but a lot of employers and teachers complain about people not following instructions. Very often people don't treat an instruction as an order, and look at it as a guideline instead. This often means that you end up working in a way that doesn't please your employer or teachers. When you play a lot of games, especially ones that have quests and missions, you pay attention and listen up carefully, because you know that success or failure is determined by how much you follow the rules of the game. Real-life is pretty similar in that sense because sometimes it doesn't matter how silly a



rule sounds, success is often gotten by following the set procedure for doing things. Yes, there is always scope for creativity, and gamers seem to abound with that, but we all know that we will follow instructions diligently if we know that success depends on it.



3 HAND-EYE COORDINATION

When playing fast-paced games – shooters such as *Counter Strike*, *Battlefield*, *Quake* or *Call of Duty*, or a racing game such as *Forza* or *Need for Speed* – a gamer needs to keep track of a lot of things. You need to aim and position yourself in shooters, and in racers, you need to fine tune your steering skills and in all action games, you need to have good reflexes. Of course, we're not suggesting that gamers would make excellent sportsmen – because frankly that would be ridiculous. However, since gamers are already usually geeky and the indoors types (exceptions like you notwithstanding), it doesn't hurt for them to hone their hand-eye coordina-



tion. Studies have shown that surgeons can hone their hand skills by gaming... So now you can tell your parents you're practicing to become a doctor when you're fragging people in *CS: GO*.

With gaming now going mainstream, more and more people are taking it up, and games are becoming more challenging as well. Plus, even simple games such as *Temple Run* on phones or tablets have a lot of us honing our reflexes on a daily basis.

With VR coming soon, we expect that multitasking and hand-eye-coordination are going to become even more important in games, and thus we will improve our skills not just by sitting on our backsides, but also while up on our feet and moving about. That should also help us shed a few pounds that we've put on from all the Red Bull and junk food we consume during our gaming binges.

4 STRATEGY, PLANNING AND MULTITASKING

Real time strategy (RTS) games often require us to manage a ton of resources, troops and units. Games such as *Age of Empires*, *Warcraft*, and *Starcraft* are prime examples of this genre. Although



you may think that RTS games only need for a player to become super fast at carrying out tasks and basically just have faster typing and mouse skills, nothing could be further from the truth.

Some of us here at Digit have beaten people at RTS games who were all about speed, simply by being better at planning and strategy. Put quite simply, a better brain will always beat a faster hand in an RTS. What this genre really teaches you is to think of multiple things at once, and not just type / execute commands at the speed of light, but also quickly read a situation, think ahead, and plan for pretty much all outcomes. This is a very handy skill to develop when you have high-stress jobs, or jobs that require a lot of multi-

tasking – doctors, surgeons, paramedics, lawyers, field engineers, stock analyst, etc. Actually, pretty much all jobs today have an aspect of this requirement, and with technology becoming all pervasive, the ability to work quickly, efficiently and strategically with tech is a huge boon.

5 LEARNING TECHNICAL SKILLS

There's many games that actually teach you a new skill. You actually learn to play guitar with games such as *Rocksmith 2014*, and of course you can play games such as *Rock Band* to get the idea of how to follow a song's rhythm, and also get interested in playing an instrument.

You can improve your geography skills with games such as *80 Days*, as you circumnavigate the world. You can use the realistic physics of space program sims such as the *Kerbal Space Program*, to learn a thing or two about physics. Even *Minecraft* helps you brush up on your electrical engineering skills – you can automate a home using redstone found within the game to power devices and control them via levers and switches. There are games that help you improve your programming and typing skills, such as *SpaceChem* or *Code Combat* (programming) and *TypeRacer* or *TapTyping* respectively. If you've got two left feet, you can improve your dancemoves with games such as *Just Dance* or *Dance Dance Revolution*. Actually, if there's an activity that is popular enough for more than a few humans to do, there's probably a game dedicated to it. There's no better or more fun way to learn something than via a game.

6 GET CULTURED

Games such as *Assassin's Creed* and *Age of Empires* (to name a few) are set in the distant past. They are often set in historical times, and even refer to events that are historically accurate. By playing the game, without even realising it, you have picked up on some ancient



history. Gamers are always the ones who will surprise people at a get together with their arcane knowledge of history or culture because they learnt it in a game. they know stuff about wars that were fought, famous generals, locations, names of important civilisations and structures, etc.

Because big budget games are usually well researched and go very indepth into their relative subject matters, they are usually accurate. Of course we're not suggesting that you believe a game over your history book, but more often than not, the two will agree.

The surprise factor of this knowledge is often worth it's weight in pure gold. There's nothing like showing up a snooty rich kid who pretend to be all cultured and knowledgeable at a party – especially if it's in front of a girl or guy you have the hots for... Or maybe we've just been watching too many silly flicks with bad scripts that are written specifically to make geeks like us feel good about ourselves.

7 TEAMWORK AND COOPERATION

Games like *World of Warcraft* and other MMORPGs require communication between a large number of people for successful raids. And games like *DotA*, *LoL* and *Counter Strike* need good communication between teams of five members in order to function as a team. It's not uncommon for gamers to make good friends over the internet these days. And thanks to the highly sociable environment that online games create, people who play online games are often found to be sociable in real life as well.

However, the most important aspect of multiplayer gaming is that it teaches us gamers patience, and the need to cooperate and work towards a common goal. Thanks to the increasing penetra-



tion of broadband internet in India, more and more people are starting to play multiplayer games, and as a result, more and more people are learning the valuable lesson of teamwork. As we've learnt from our online gaming sessions ourself, a good team average players with great understanding and willingness to cooperate often beats a team of skilled individuals who all go at it alone. So what are you waiting for? If you're a multiplayer gamer, you better start updating your CV right away and adding in all the jargon we've thrown at you. Who knew playing *WoW* and *DOTA* would allow you to add skills to your biodata, right?

8 STRESS MANAGEMENT / LEARNING TO LOSE

If there's one thing gamers are really good at, it's keeping their cool. PC gamers especially are like Xen masters. No one knows how frustrating it can be to try and then fail, and then try again, and fail even more miserably, but never giving up, no matter how useless the goal seems, until at last you succeed. You just cannot be a gamer if you can't handle frustration and defeat. We gamers learn from our mistakes like no other, and we do it (mostly) without losing our cool. Add to that the fact that PC gamers have to put up with Windows bugs, dying hard drives, constant upgrade cycles and buggy drivers... As if the games weren't hard enough on their own, we have to deal with a bucketload of other problems. It's all worth it in the end though, because we always excel, we always over come, we always win. PC Master Race ftw!

Oh we almost forgot. We're supposed to mention a game name: try *Keep Talking and Nobody Explodes* if you want to try a really stressful game.

9 RISK TAKING

Going with the previous point, you can't learn to take calculated risks unless you have both lost and won in life. That's pretty much the standard description of a gamer. Taking risks is part of games, and with the serious nature of a lot of games these days, there's often actual money or a large time investment involved. If you fail, you stand to lose upgrades, or stuff you've bought, or worked hard for... there's "real" loss involved these days, not cute "deaths" like



in the Super Mario days. All of this makes gamers more prepared for real life problems, especially in work environments.

10 ENTREPRENEURIAL ABILITY

Tycoon games have been around for some time now. Our first taste of It was *Zoo Tycoon*, and boy was that fun. At first it was just fun to put people in cages with gorillas (to soon?), and watch as they were terrorised, eventually we started playing the game to win. Then things got really serious – from ticket pricing to choosing the cost of snacks, managing the cost of the hired help and having to account for maintenance costs, pretty soon we were thinking long and hard about every financial decision.



However, it's not just business sense from tycoon games, there's also online RPGs for instance, which have little economies of their own, and you have to learn to master the rules of the game to succeed and gather resources. You learn about supply and demand, and how important it is to have what is in demand, etc. All of this adds up to gamers being really savvy money managers, and perhaps prepares them for the stock markets. Of course, all of the smarts we earn from games can't prevent us from splurging on something extravagant to enhance our gaming experience! We're only human after all!

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DIY PROJECT IDEAS

FOR YOUR NEW SCHOOL YEAR

WANT DIY IDEAS TO WOW YOUR TEACHERS AND PEERS AND JUST TO HAVE SOME FUN THIS YEAR? BEHOLD!

JAYESH SHINDE

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Vacation's over. You're back in school. Time to stick to the curriculum, execute all your assignments on time, and leave no stone unturned in your quest to get good grades come examination time. Is this all that there is to school life? Well, here's a little something we've put together to help you earn some brownie points and enhance your reputation on campus as a DIY nerd.

1 LAUNCH A PHONE INTO SPACE

At first this idea may sound absurd, but think about it - if you have an old smartphone lying around, you can attach it to a high-altitude weather bal-



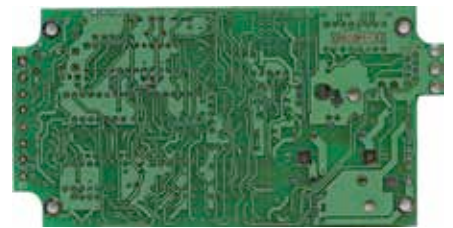
loon and launch it as high as 30 to 50 km above the earth's surface. Straight into the stratosphere!

Purchase the balloon (with a burst altitude of 100,000 feet) for as low as ₹2,000 to ₹3,000 (like this one <http://goo.gl/DeM2gR>), go to a recreational space, find a balloon seller, pay him to fill your weather balloon with Helium, attach your old smartphone to it with video recording turned on, attach a small powerbank to it for good measure (make sure the whole payload is under 500g), launch your balloon. Also, read about NASA's PhoneSat initiative and ways to better protect your smartphone in extreme cold and hot weather (<http://goo.gl/zL78M>), if you're seriously planning this stunt. For a slightly more serious minded project, check this out: <http://goo.gl/28HVc3>.

2 MAKING A PCB

Whether you're a student of electronics or not, it doesn't matter. The fact that a printed circuit board (or PCB) is inside of pretty much all our digital toys is reason enough to get your hands dirty and try making the fun-

damental building block yourself. Consider it as a rite of passage. With just tools available in your home or garage, you can make your own PCB - yes, without a CNC machine or the rest of the jazz.



Just get a copper clad board, some hydrogen peroxide (the stuff ENT specialists use to clean your ears with), a hand drill machine and a laser printer. Oh, and don't forget the schematics of an actual PCB for you to be able to test! For detailed steps, go here: <http://goo.gl/UIN345>. Piece of cake, right?

3 BUILD YOUR OWN DRONE

Don't worry if you can't afford the latest and greatest quadcopters launched in the market - DJI Phantom,



we're looking at you! With cost of electronics parts as cheap as it can get, and public interest in drones on the upswing, there's no better way to create a surveillance drone and donate it to your college's security team. The process couldn't be any simpler than what one spirited DIYer describes here: <http://goo.gl/f1O8af>.

The total cost of this project shouldn't be more than a couple of thousand rupees. Connect an old smartphone to it, keep it in range of a strong Wi-Fi signal, and you will be forever in your college security guard's good graces. You may rub the campus crowd the wrong way, though, be warned.

4 BLUETOOTH-CONTROLLED LIGHT SWITCH

I'm sure you know that the worst thing that can happen when you've finished your chores for the night – you plonk yourself down into bed, and there's that dratted light that you forgot to switch off. Absolutely hate it when that happens, right? Well, here's a DIY project (<http://goo.gl/AHsSHH>) just for all us lazy asses out there: program an Arduino-based microcontroller that plugs into your light bulb's wall socket, a breadboard, a small power switch to regulate power, and a smartphone app. All this to ensure you never have to get up to switch off the light ever again! Insane, but creative.



5 A PERSONALIZED AR EXPERIENCE

Most of you reading the magazine over the past year or so must have tried how we have hidden AR links and content animations wherever you see the Blippar logo. If you've ever wondered how such AR implementations take place and want to implement your own AR solution, this is a great DIY that helps you do just that: <http://goo.gl/iEQHDy>.

You need to have some working knowledge of Unity and dip your hands into



Vuforia, an AR SDK, but it's nothing too difficult. Think of the possibility of doing something like this in your college fest? Markers and AR descriptions on a real-life map? Come on, get cracking!

6 A POCKETABLE RASPBERRY PI-BASED COMPUTER

The champion of miniature computers, driving a new wave of hobbyist com-



puting, the Raspberry Pi's capable of far more than people give it credit for. According to this expert-level DIY project, you can run a full Linux distro on a Raspberry Pi-driven pocket laptop made out of... a couple of portable hard drive cases! Seems too good to be true?

We thought so, too. Until we saw this project and felt our jaws drop and hit our work desks in a mixture of awe, embarrassment and jealousy. Warning, this isn't for the faint of heart: <http://goo.gl/SI6u5n>

7 GLOWING LIQUID LAMP

Similar to a lava lamp that you might have seen in stores, but this glowing liquid lamp is built on a strict budget. How modest? Well, the colour inside the glowing liquid is derived from highlighter pens, the lamp itself is made from a transparent plastic tube, and it's powered by just ten or so LED bulbs.

It's fancy but not over the top – an exciting addition to your nightstand or a corner piece of your living room. See



how to make the glowing liquid lamp in this extremely descriptive, step-by-step YouTube video: <https://goo.gl/K7fpfA>

8 BUILD A RETRO GAMING CONSOLE

All work and no play makes everyone dull, not just Jack. So while you're hard at work at school this year, it's important to relax and unwind from time to time. And what better way than to unwind



playing some of the best retro, arcade video games ever known to mankind?

This final DIY project that we've presented to you only needs four physical components – a Raspberry Pi, a USB controller, Power adapter and a microSD card. Using a RetroPie image and downloading emulator ROMs on to the SD card, you can unlock joys of gaming past right in your hostel's living room, as you show off and play games on your retro games console. Enjoy! <http://goo.gl/fsUSjI>

TECH TO SPUR YOUR YEAR

WHEN IT COMES TO SUPERCHARGING THE UPCOMING YEAR, TECH CAN GIVE YOU JUST THE BOOST YOU NEED

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Whether it be moving from school to college, or a new class, every new academic year brings with it a sense of change and fresh opportunities. It might be the opportunity to perform well academically, or gain a new skill this year, or get your body back into shape, or all of the above! Whatever anyone might tell you, the only thing you really need to achieve all of this is your own willpower. Of course, the problem is really how you can stop yourself from being distracted from the tasks at hand every 10 seconds... With tech obviously, because *This is Digit* (say that in your head as you would say "This is Spartaaaa!").

SMARTWATCHES AND SMARTBANDS

Smartwatches might seem unnecessary, especially when you look at their price tags, but they can be pretty handy (pun intended!). Because they are extensions to your smartphone, you don't have to whip out the phone to check every notification or message. The fewer times you check your phone, the shorter your

distractions will be. The Pebble Classic, currently at about ₹5,999, is a good choice for a simple smartwatch.

If a smartwatch seems like overkill, and you just want something for health reasons, you can opt for a smartband instead. Current generation smartbands can track steps, sleep quality, heart rate and detect gestures. There are a number of really budget options but most of them have accuracy issues. We suggest you save up and cough up the money needed for the Jawbone UP2. It's more expensive than the Pebble classic, but then you can't put a price on your health, can you?



There are a number of low-cost rip-offs available in the smartwatch market. Buyer beware, as usual

AUDIOBOOKS

Modern day cities are plagued with traffic problems that often leave people stranded on the road for hours. School buses and students travelling to coaching classes are not exempt from this, especially if you live far away from the classes. We know how important time is to you students, especially around exam time. So what do you do to pass the time? You read of course... however, Indian roads aren't exactly the smoothest in the world, and thus, with all the bumping around, you're likely to cause yourself eye strain if you try reading. Audiobooks are just what the optometrist ordered for such situations!

A good online source for high quality audiobooks is audible.com (an Amazon company), with numerous categories available including Language instructions, Science and Technology and Personal growth. It also has an android app that you can check out here: <http://digit.in/AudibleApp>, as well as Audio books by Audiobooks.com, which is another good app for purchasing and listening to audiobooks that you can check out here: <http://digit.in/AuBooks>. Both audiobooks

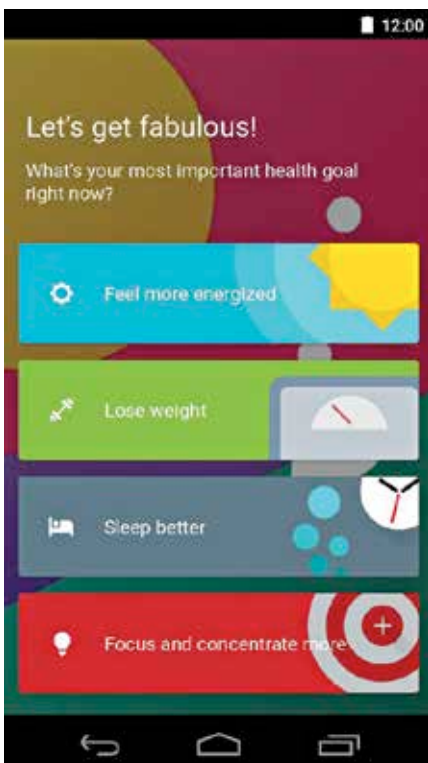
and headphones have come a long way in terms of quality and you might actually fall in love with this mode of learning.

BROWSER PLUGINS

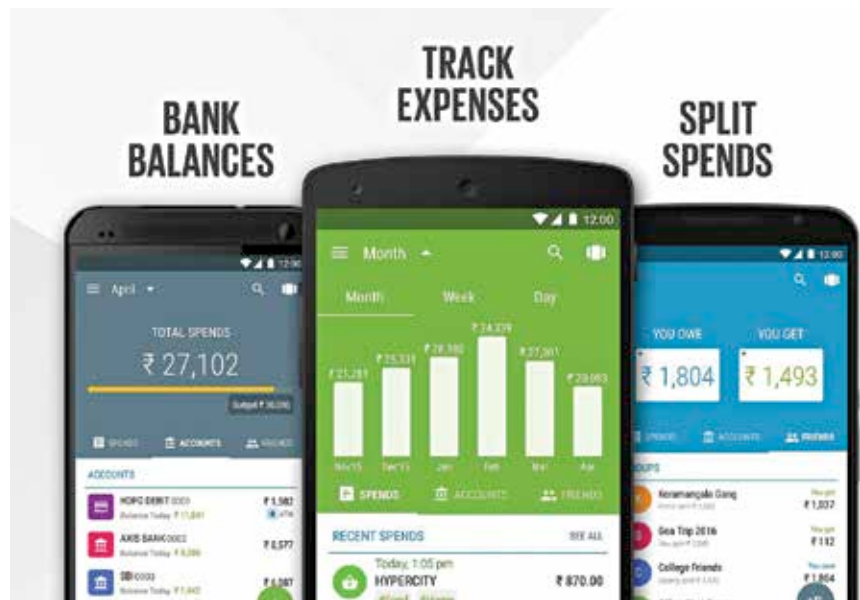
The internet is both the biggest source of information as well as the biggest source of distraction universally. It can literally be a pain when you suddenly realise that it has been 2 hours since your research for the class project turned into a cat video binge watching session on Youtube. Install the StayFocusd browser extension for Chrome and LeechBlock for Firefox. They allow you to specify certain websites as time wasting or unwanted websites. StayFocusd allows you to set a particular duration of time for which you can access the site for the day, whereas Leechblock allows you to block the websites entirely for certain durations of the day, say 10am to 10pm. once you have trained it, and are honest with yourself, these are superb time savers.

GET FABULOUS!

No, that is not an abstract phrase we just threw out. Fabulous is a motivational app that helps you feel more energised, lose weight, sleep better and stay focussed. In fact, these are the four choices that the app



The four categories offer a host of different activities



Walnut is one of the most highly recommended and used expense trackers out there

offers you once you get started. Depending on what you chose, for example “losing weight”, it asks you a few questions to figure out more about your current status, for example “when do you have lunch”. Post that, it suggests you to add a few habits into your ritual for that time, for example “eat vegetables and fruits”, “drink water”, etc. Now once you have set that, it will remind you at those particular times. This is only one of the ways to use the app, and we will let you explore the rest on your own. Go on, get Fabulous!

COLLABORATION TOOLS

Big time corporate projects are not the only ones that need organising. Classroom projects and group assignments can be quite difficult to get done as well. Although you often can't choose your teammates, you definitely can choose a tool to collaborate with them. Basecamp is a popular choice. It lets you create a new “Basecamp” for a project, add members to it and set timelines for the completion, while providing instant messaging and document management tools. Another app that is quite popular for team communication nowadays is “Slack”, which, along with a number of interesting features, has integration with a number of apps such as Google Drive, Dropbox, Twitter and more.

SET AND FOLLOW A BUDGET

If you aren't one of the lucky ones that have an unlimited supply of pocket money, and doting parents, then you're

going to want to pay attention to your finances. Almost every bank these days offers a junior Debit card that has limited risks when it comes to being stolen, but functions exactly like a proper Debit card. Some of them also have added benefits such as unlimited free withdrawals from other banks ATMs, which is pretty important for students studying in more remote areas. Also, if the card comes with an SMS update facility, you can use money management apps such as Walnut or Moneyfy to track, analyse and plan your spending.

SET UP MULTIPLE DESKTOPS OR MULTIPLE ACCOUNTS

Not everyone can afford completely different machines for different purposes. Yet, you don't necessarily need the internet to be distracted. Often a PC itself can be a distraction. If you have a lot of games installed, for example, you can be easily distracted by that beautiful icon on the desktop. If you have Steam installed, you might get an update that a friend is playing your favourite game right now. A quick way around this is to set up multiple desktops. Mac supports this via the built in Mission control, and Windows supports this on Windows 10. Plus, there are free apps to do this for older versions of Windows. You can also set up a limited access guest account into which you login whenever you need to focus on getting work done. Now excuse us as we drop everything to go off on a CS: GO session. You... umm.. go study or something...

HOSTEL LIFE THE TECH SURVIVAL GUIDE

DON'T WAIT FOR ALL ELSE TO FAIL. USE THESE TECH
TIPS TO SURVIVE HOSTEL LIFE!

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You must have a lot of memories from your school and college days that you look back to from time to time. But if you lived in a hostel, we're pretty sure not all of those are fond memories (shudder!). We don't mean to scare all of you newbies headed to college hostel life... actually, to be honest, we do intend to scare you... be afraid, be very afraid, and heed the advice in this article, or else!

TERMINATE RAGGING

Often, the first thing that happens when you move to a hostel is a bunch of older people showing up, mostly late at night, and bully you into doing tasks that may be funny for them, but quite an ordeal for you. Fear not! Taser gun to the rescue! Although we strictly advise against violence, some threatening and some tools to help you defend yourself might help put bullies in their place. You can buy one online quite easily, although before you do that, check the reviews, the voltage and the legality of the device. Not all tasers available online are non-lethal – you want to scare them, not fry them.

UNREACHABLE ROOMMATE

We all know that one person who transcends reality the moment they start talking on the phone. They don't care how loud they are, whether the topic they are yapping about makes you cringe, and certainly they don't care about anyone else's privacy or private space. With your luck, this person will be your roommate! how do you save your sanity? You buy a cell phone signal jammer of course! Some might claim a range of 100 metres or more, but you just want a pocket one that claims 2-5 metre ranges. Make sure to not get caught though, or else you will never hear the end of it – literally!

SURVIVE THAT FOOD

There are going to be days when hostel food looks (and tastes) like nothing short of nuclear waste. Although most students develop cast iron stomachs after a while, your stomach has only ever felt the love of your mother's cooking, never the hate of a frustrated mess chef! You're going to need to install food ordering apps such as Swiggy or Foodpanda. If only there was an app to teleport mummy's food to you!

PROTECT YOUR VALUABLES

Theft is wrong, but not everybody cares. And hostelmates don't understand the concept of personal belongings. From clothes to gadgets, everything is fair game if it's left lying around. Remember, nothing ever gets stolen in a hostel, merely "borrowed". Most of us are still waiting for this so called borrowed stuff to be returned, and for some of us college was many years ago! Besides, there's no way of telling who took what.. Or is there? A wireless camera is a bit heavy on the pocket, but it will give you (and others) a guarantee that nothing can be stolen from your room, ever again. The accompanying app will let you keep an eye on your room even when you're away. Just make sure you have a way of securing the camera, or the first thing to go will be that!

MUTE THE WORLD

If the jammer option didn't work for you, you probably have roommates who talk loudly and incessantly, phone or no phone. Or if you are really unlucky, the room next to you plays music at full volume right when you want to study.



Both the Omega and its sibling Delta do not look cheap despite being so

Before you reach for the taser, you can do away with the distraction by getting noise cancelling headphones! You need to strike the right balance between budget and effectiveness, and we recommend the Brainwavz Delta, or its slightly cheaper cousin, the Brainwavz Omega

DODGE THAT POWERCUT

Powercuts are a part of hostel life, and some of us may be rich enough to afford colleges where even the hostels have inverters and generators, however, our guess is most of you won't be those luck few. You're going to need lights, no matter what, because you need to see to do almost anything that people do in hostels (What? We did say almost!). Cooling can also be a serious requirement, because it's often impossible to think straight when you're literally being fried in your own sweat... Get a powerbank and some USB lights and fans, and you will thank us for as long as you live. Just remember to make sure the powerbank itself is regularly charged.

SOLVE THEM IOUS

Hostel mates are super chatty and attentive and fun to talk to, until the bill arrives. Then suddenly everyone's busy tying their shoelaces, examining the menu, staring off into space, and counting the amount of lines on the striped tablecloth! If you find yourself picking up the tab more often than you'd like to, which you will, you need to get apps such as Splitwise or Mypoolin. These apps help keep tabs of who owes who how much money, and there's no convenient forgetting about

the amounts anymore. Some of us would have paid off our student loans a few years earlier had we had these apps in our time.

TRACK THAT INVADER

Be prepared to learn some interesting new smells in hostels. How does someone smell when they haven't showered in two weeks? What do socks used consecutively for a month smell like? You will find out... Get a UV light, so that you can check for human "influences" in your room and all over your stuff. Unless you're the one who doesn't bathe or change clothes...

JUGAAD!

Need to dry a shirt quickly? Turn the trusty microwave into a dryer. You will need to use the lowest power setting, and take it out, shake it a bit and turn it inside out about every 30 seconds or so. And remember no metal, no elastic and no synthetic fabrics. No mirror in the hostel? Use your laptop webcam to shave. Starving at midnight after the kitchen is locked? Get some instant noodles and cook it on your clothes iron (figure out a safe stand for it and call yourself jugaad king henceforth), and behold! Your new cooktop!



Not exactly Gourmet food, but often just what you need!

FOOL THE WARDEN

Sometimes, a strict warden can be a bigger roadblock to your weekend plans than hail and hellfire. Rather than taking that as a disappointment, take it as a challenge. Download a voice modification app and pretend to be, well, someone who is authorized to speak to the warden. Of course, be ready for a thrashing later!

BREATHE SAFE

More often than not, in your hostel life you might encounter people who are quite significant contributors to...err... air pollution, even if you make it clear that you have a problem with that. Rather than getting

into an endless debate with someone who has already decided to kill themselves slowly, you need to get yourself a portable air purifier. And, of course, rely on one of mankind's most technologically advanced architectural innovations to breathe - Windows, not the Microsoft kind.

VISUALISE YOUR DREAM HOSTEL

With smartphones hitting the market with integrated support for Augmented Reality, we can't really say that AR is still far away. And what better (and less expensive) way to live in a hostel of your dreams? Although you might still have to develop the necessary software that would change the walls, the ceiling, the fans and pretty much everything around you to make an AR environment, it would still be worth it. For some of you, it might be the only way to stay sane, and prevent you from questioning the very purpose of your life, and planning on running away to the Himalayas for some serenity.

SAVE SOME MONEY

We do realise that we have recommended a bunch of expensive ways to survive hostel life to you. And being former hostelites ourselves, we know the perennial state of being broke quite well. Don't worry, we've got your back there too. There are a number of financial planning apps that integrate with your phone's SMS application to detect any transaction that generates a text message to your number. It then categorises these expenses and generates reports to show you exactly where you are overspending and where you can save more. Even if you do not transact online or via card much, you still have the option to enter your spending manually. Do it at the end of the day and see those savings magically pile up! A few of the easy ones are Walnut, Mint and Moneyfy.

BUCKLE UP

Despite all we've said, hostel life isn't all bad, and some of the best memories and best friends you will ever have await you in your hostel. Just follow the tips we've given you and you will live through your first year. It's all down hill after that! Plus, never fear when you have tech by your side. If there's a problem you think we missed solving, remember to write in and tell us. [d](#)

LAPTOP OR TABLET: WHICH ONE TO BUY?

WHEN IT COMES TO CAMPUS LIVING, WHICH ONE OF THE TWO MOST DEPENDABLE MOBILE COMPUTING DEVICES SHOULD YOU BANK UPON? WE HELP YOU DECIDE BY GIVING YOU ADVICE YOU WON'T FIND IN ANY COACHING CLASS!

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Not just a buying guide on laptops and tablets, this article's going to outline scenarios that you might encounter in school and suggest the best device for use in that situation. And in doing so, we'll try to arrive at a device recommendation that makes sense to splurge some of that hard-earned student loan money on.

BEST FOR IN-CLASSROOM USE = TABLET

A couple of years ago, we would've strongly urged you to buy a laptop in this case, but now due to advancements in tablet features and the availability of a wide range of keyboard accessories, you are better off with taking a tablet inside the classroom for note-taking. Here's why:

There's one distinct advantage that a tablet enjoys inside the classroom over the trusty old laptop of old. A tablet comes with a rear camera, while a laptop doesn't, and this makes a huge difference. When you're sitting up there in the very first row of your class, close to the blackboard, if you're fed up of quick notetaking, you can swiftly just launch the tablet's camera app,

hold it up and take a photograph of the chalkboard, preserving a visual memory of whatever impromptu scribbles your teaching faculty has made (which may not make into the class notes he or she hands out later). You can't do that with a laptop, there's no chance.

With peripheral manufacturers upping their game in terms of highly customised offerings for Android or iOS tab-



No, tablets aren't dead... not yet

lets, finding a keyboard that just simply works with your tablet is now extremely easy. Whether it's an iPad or Android tablet, you can find slim keyboards for either of them with OS-specific key layout – for example, instead of a typical Control, Alt and Shift keys found on a QWERTY keyboard for PC use, Android-ready keyboards meant to be used with tablets have Back, Home, Multitasking, etc, keys to make you feel at home while working in the OS. Bottomline, typing on a customised physical keyboard paired with a tablet is almost the same as typing on a laptop.

BEST FOR UNCOMPROMISED USE = LAPTOP

Sure, the tablet beats the laptop when it comes to using it inside a classroom environment, but there's no denying the fact that as an uncompromised performance machine the laptop beats the tablet every day of the week.

For high-performance tasks such as HD video editing, graphics editing with print quality artwork, 3D models rendering and good old PC gaming, you have



Laptops for anything that has professional Tools Involved... always

to have a laptop to work with at school, as a tablet just won't be able to cut it. Yes, a tablet will (in most usage scenarios) have better battery life in comparison to a Windows laptop (MacBooks are a different ball game altogether), but being stuck with a mobile computing device which simply lasts longer with zero productivity isn't a lot of fun, is it?

However, if you play your cards right and buy a laptop with the latest generation of Intel chips, especially the ones which have a "U" in their model number, which are sub 2-GHz in clock frequency, chances are you will get a Windows laptop that gives you between 6 to 8 hours of battery life, which is definitely comparable to a tablet's battery performance.

Another area where the laptop doesn't feel as compromising as a tablet is when it comes to its connectivity features. Because a conventional laptop has a great amount of physical connectivity ports – like a USB port, HDMI or DisplayPort, universal dock, etc. – life is a lot easier when it comes to attaching additional

gadgets to your laptop than a tablet. For example, if you need to connect an external hard drive to your laptop, all you have to do is just plug it in. You'd be hard-pressed to do this as easily and effortlessly on a USB-less tablet.

MOST ULTRAPORTABLE = TABLET

Come on, you know who wins this category unanimously. Although they've shrunk in size over the years, laptops are still thicker and heavier in comparison to the sleek and slim tablets. Granted some 10-inch laptops (technically, netbooks?) can tip the scales at the same point as some of the thicker 12 or 13-inch slates or tablets out there, but in the more popular 7-inch and 10-inch form factors, tablets rule supreme in terms of offering unprecedented ultra portability in comparison to a laptop.

Just look at a tablet – you can hold most of them in one hand and read books or watch videos on them. Laptops need a place to put them. You can just pop a



You can't beat the portability of a tablet

tablet into a backpack, and it even fits into large purses or handbags. Most decently powerful laptops need a bag of their own to carry them. Lastly, when there's a choice between carrying a laptop or tablet on your daily commute to school, usability and performance aside, just by sheer weight alone, most of you would prefer carrying the slimmer and lighter tablet. Bottomline? Almost all tablets weigh under 1 kg easily, whereas finding a laptop under that weight limit is a rarity, and when you do find a laptop that's comparable in weight, you find out they cost as much as two or three tablets!

TOUCHSCREEN VERSUS WIDESCREEN = HMMM

This one's slightly tough to call as both tablets and laptops can possess both features. By default, though, all tablets support multi-touch input, whereas not all laptop screens are touchscreen enabled. What's more, laptops with touchscreen support are much costlier than the non-touchscreen variants, obviously. If you need the convenience of a touchscreen without breaking the bank, then a tablet is the right option for you. However, a word of caution when it comes to touch screens – they're great for consuming media and information, but for typing or frequent inputs an on screen keyboard can be a pain in the proverbial derriere. You can always opt for a keyboard accessory, of course, but if you really do a lot of typing (like we do), you're not going to enjoy those keyboards too much, and you certainly can't dream of making do with the touchscreen!

When it comes to widescreens, we aren't just talking about resolution but actual physical width of your device's screen. Where most tablets come with 1200 x 600 screen pixel resolution and most laptops default at 1366 x 768 pixels, laptop screens are almost always larger in size in comparison to tablet displays. If you spend more, it's possible to get Full HD screens on laptops and tablets both, and chances are that between those two tablets are almost always available for cheaper (because they're smaller in size physically). We don't know about you, but when it comes to staring at your screen for long durations to read something, a tablet seems to be the best choice. However, you can't beat that larger real estate found on a laptop form factor. If



If you can't afford it all, you'll have to choose between a widescreen and touchscreen

you need to collaborate and sit with others looking at screens, a laptop might be the better option as they have physically larger screens. It's a toss-up though, and you're going to have to make up your own mind here based on your unique requirements.

BEST RESALE VALUE = LAPTOP

Discounting iPads, most Android tablets don't have very good resale value – apart from Nexus tablets. Even flagship tablets launched by very reputable brands feel slower and sluggish after a year of usage, amounting to less than premium returns on websites such as eBay, OLX and Quikr, for example. Why do Nexus tablets do slightly better in the resale market than the average tablet? Simply because of their longevity in terms of operating system

and support for latest Android updates. But overall, as a product category, tablets is one of fast diminishing returns.


Laptops don't suffer as badly from that problem. If, for whatever reason, you plan to sell a laptop after just a year of using it, in terms of percentage value, it will offer better returns than a tablet – if both of them suffer from the same amount of wear and tear, presumably. Why this dichotomy? The incremental updates witnessed in hardware platform on the laptop side differs less and less every year and the line representing OS-level changes is largely flat as well. Also, you can run Windows 10 on a five year old laptop – without voiding warranty or jumping through hoops or worrying about “bricking” your machine. You don't have

any of these luxuries on a tablet which is one year old, which you're about to list on eBay, thus impacting its resale value far more negatively. Also the price points that tablets sell at are so much more affordable than a laptop's, people don't think about just flat out buying newer devices without a second thought – which is not the case with a laptop.

WHICH ONE?

Both laptops and tablets have their strengths and weaknesses. The thing about tablets is that they're extremely convenient and easy to use. If you're going to be working on your web browser, Google docs, listening to YouTube videos and streaming movies and music off the web – without having to take a lot of printouts from your printer and other stuff for your project, etc. – you're better off buying a tablet. There's no denying its highly ultraportable form factor and it's great for one-handed use (compared to a laptop) any given day. It can also double up as an ebook reader, and is undoubtedly the more multifaceted device when you stack it against a traditional laptop.

However, we can't deny that a laptop is definitely the closest to a PC in this comparison, and therefore is the most versatile. When you need to run certain software, or need a larger HDD to store stuff on, or need to fire up something to quickly get work done, a laptop will always beat a tablet. When it comes to college projects and doing research with 50 browsers tabs open, you're going to be yearning for a laptop if all you have is a tablet. Android or iOS just cannot compete with full-blown Windows when it comes to productivity. You're going to also have to consider your specific requirements. If your college has physical LAN and no Wi-Fi, you have to choose a laptop. If you need to print a lot of stuff and format documents, again, a laptop. If you need to do video editing, image editing, and yes, gaming, you need a laptop.

However, if you're in a more creative field, need to draw, don't play serious games, and yes, we'll say it, want to show off just a little, an iPad Pro just looks way cooler than a boring laptop... We never said the choice would be easy, we just said we'd have you thinking about stuff logically... What's it going to be? Write in and let us know. 



You can sell a laptop for a decent price, but not a tablet

worldview

OUR PICK OF THE BEST TECH ARTICLES FROM AROUND THE GLOBE

(MUST READS)



THE FLYING CAR FACTORY

In the neighbourhood of Google (well, literally) there's someone designing, building and testing newer ways of transport that could take off and land vertically.

<http://dgit.in/JetsLife>

CHATBOTS ON LINKEDIN?

With Microsoft and LinkedIn joining hands, several questions pertaining to the reason of the merger such as the new working model along with various other strategic changes have surfaced. LinkedIn's co-founder and Microsoft's newest weapon answers them all.

<http://dgit.in/MSLIn>

THE WORLD OF NETFLIX

Expanding to 130 countries throughout the globe at once, Netflix has definitely added a large number of subscribers but what do the revenue collections say? Here's Netflix unveiling its future plans and its survival kit for the world it has created.

<http://dgit.in/NetfxWd>

WHO IS BIG DATA?

The internet is full of definitions for Big Data, but none of them take into account its inherent humanness or provide the relationship between technology and the newly defined human. Most skip them. Here's everything you maybe didn't know, but should.

<http://dgit.in/WhosBD>

[The Verge Corner]

WHAT'S UP XBOX?



In a fight to keep consoles and console gaming alive, Microsoft is skipping no option to miss out on anything that can potentially get them to turn more heads. With the unveiling of the Xbox One S and features like XBOX Play Anywhere at E3, does the future hold merging of the PC with an XBOX? <http://dgit.in/XboXPC>



Relaunching the App Store

Subscription or One Time Payment – how would you like to pay for apps? Following the 70-30 revenue sharing model, is it about time for Apple to go the subscription way that might also attract more app developers by recreating its App Store?

<http://dgit.in/iAppStr>



Daydreaming the VR

Virtual Reality is oncoming fast, but the main concern remains the same – how equipped are current platforms to host VR Content? Google's Daydream for YouTube, for example is in a fix whether to include comments (if yes, then how) or give it a miss.

<http://dgit.in/DDrmVR>



Shift to the software

The year 2015 was not one of the best that GoPro has seen. It has decided to route itself back to the drawing board. Adding to the software team, GoPro has already launched two mobile editing apps this year. Looks like GoPro's betting big on the software front now.

<http://dgit.in/GoSoftw>

AI STILL NEED TO LEARN



Thought machine learning might put your job at risk? Well, that might not be the case entirely. Here's a Robot's attempt at writing an article after being given a crash course in journalism and being made to learn from an author's past writings. <http://dgit.in/AIWrites>

CON-FUNDING?



We've shared enough rosy, successful crowdfunding stories, but this is a cautionary one, which are becoming quite common these days. Campaigns rocket-off based on mere hype and receives huge amounts of money without even concluding if the idea is actually feasible. <http://dgit.in/ConFnd>

THE DIFFICULT CANCELLATION



App stores and developers are now adopting periodical subscription models in exchange for some convenience. These apps are well on their way to burning a hole in our wallets making the 'unsubscribe' button the most difficult to reach. <http://dgit.in/AppSubsc>

SCRUBBING YOUR ONLINE IDENTITY



With data miners targeting every minute bit of your information out there on the internet, keeping a track of your online identity has become necessary with evaluators giving more weight to your identity online. <http://dgit.in/Intldnty>

What is Sony's Predictive Hybrid Autofocus technology?



Sony wants to completely remove out-of-focus shots, but that day may not be here yet.

- By Souvik Das

When Sony announced the Xperia X lineup at Mobile World Congress 2016, much of its presentation revolved around the innovation the company is doing with the smartphone camera. Many rejoiced, proclaiming it was about time Sony capitalised on its strengths, rather than trying to play along with market trends. A few days back, we got to try the Sony Xperia X and its camera, and see if Sony actually means business.

Predictive Hybrid Autofocus, which as of right now is present only on the Sony Xperia X and X Performance, is Sony's solution to ensure photographs aren't missed because of slow focussing or inefficient

subject tracking. While the Sony Xperia X Performance remains out of reach for the Indian market, the Xperia X has been introduced here at an introductory price of ₹48,990. And while it does raise a certain amount of excitement, it also raises an equal number of questions.

Note: The following photograph samples are by the Sony Xperia X to the left (shot with Predictive Hybrid Autofocus) and the Huawei Nexus 6P to the right (standard focussing).

WHAT IS PREDICTIVE HYBRID AUTOFOCUS?

Introduced in the Xperia Z5 lineup, Hybrid Autofocus merges phase detection and

contrast autofocus mechanisms to present theoretically accurate focussing of subjects. It uses phase detection to gauge the frame, and based on a subject's distance from the camera, determines its focus. Contrast autofocus kicks in for more minute adjustments, and the difference in contrast levels of chrominance (colour data) aids in fixing focus. In previous Sony devices (and the newly-launched Xperia XA and XA Ultra) using only Hybrid Autofocus, the focussing mechanism kicked in only after you pressed the shutter. Sony's claim lay in the devices being capable of shooting the photos within 0.3 seconds. This is time span between you tapping on the shutter and the photograph being saved.



Sony Xperia X (L), Huawei Nexus 6P (R)

THE PSYCHOLOGY OF CHANGE



It's said that 'change is good for innovation

& survival' and it's probably also one of the reasons brands choose to revamp regularly. This change however, has major effects on the psychology of its users every time these companies bring in a change. <http://dgit.in/PsyOfChg>

AI IS THE WAY TO GO



Facebook has been adding newer features and adopting newer algorithms like never before, it not only wants to focus on embracing AI but also excel in machine learning, in order to build the world's most powerful ad platform, leaving its competitors behind. <http://dgit.in/FaceBkAI>

PAC MAN SCORE - 3,330,360



Navigating through 256 levels and eating every pellet, fruit, and ghost, that too without dying, Billy Mitchell, the 'Pac Man' achieved this verified perfect score on a arcade machine with a playtime of around five and a half hours. <http://dgit.in/PacManHS>

TILL THE LAST MILE



This one isn't about the wonders of TCP/IP or the working of the internet but about the technology that goes into how stuff works, such as things with bigger infrastructure like submarine cables, landing sites, and data centres, which play a pivotal role in hooking billions of us to the Internet. <http://dgit.in/IntDataC>

Unfortunately, the Hybrid Focussing mechanism, coupled with its image processor and Sony's algorithm, was far from being the fastest camera module around. Hence, the rise of Predictive Hybrid Autofocus. What the technology essentially does is provide a better, artificially intelligent camera algorithm, a faster image processor and better integration of the camera hardware and software. Sony has essentially used an Exmor RS mobile imaging sensor here, improving its algorithm and processing capabilities. Sony now claims that in 0.6 seconds, you can go from idle to photograph captured. Predictive Hybrid Autofocus comes into play as soon as the camera module is switched on. It reads the frame, adjusts to the possible subject by phase detection autofocus, and locks on to it. This is particularly beneficial for moving objects, as you have very little time to adjust focus or select the subject in such situations. Its predictive algorithms read the screen and assist fully in choosing the subject. This, till the time your photograph is saved, is expected to take 0.6 seconds.

HOW WELL DOES IT WORK?

In real life, the implementation is a tad different from what it sounds like on paper. While the camera does set up its focus point almost instantaneously, manual reset of the



Sony Xperia X (L), Huawei Nexus 6P (R)




focus (which you may often need) takes a longer amount of time than what you would expect. The predictive technology is particularly useful if you are shooting moving objects, and the camera often struggles if the subject of the photograph is moving too fast. In regular situations (shooting landscapes or portraits, for instance), there is little to no visible upgrade in the camera's speed of shooting. The company is attempting to bring the technology to its smartphones from the Sony A6000 lineup of mirrorless cameras, and while it is much better implemented and has more practical applications in a dedicated camera like the A6000, its effect of promoting the Xperia X to greater heights is marginal.

In ideal situations, with bright lights and little to no background activity taking up processing power, the technology works better and you get to take better shots with more

precise focussing and marginal subject blurring. As you progress to dusk or low light situations, PHAF struggles to maintain its performance. It may work better on the Xperia X Performance with Qualcomm's Spectra ISP working faster in tandem with the Snapdragon 820, but we are yet to test that.

THE POTENTIAL AND FUTURE OF PHAF

To sum up, while the technology has potential for majorly improving the experience of shooting photographs at races, wildlife, or even shooting on the move, it has not been very well implemented yet, and almost certainly not well enough to be a very notable. It is, however, an answer to what other OEMs are doing with their smartphones. Samsung brought Dual Pixel to the table, majorly improving focus duration and light and colour data processing. While the Predictive Hybrid Autofocus technology may not be as vividly noticeable an upgrade as what Samsung has done, it is a peg for the future, and once developed to its full potential, has the ability to remove out-of-focus shots and difficulties in autofocus in video shootings from mobile devices.

As of now, the technology is not too noticeable in the Sony Xperia X. As for the future of smartphone photography, it may be an important step to take, taking us ever so closer to dedicated camera phones. 



Sony Xperia X (L), Huawei Nexus 6P (R)



LOUIS ROSSMANN

Louis Rossman's channel is a dedicated DIY repair channel and it's targeted towards DIY enthusiasts. It features videos



describing how repair stores get your tech back to working so you can do it yourself at home with commonly available tools. <http://dgit.in/LRossmn>



To get all these links in one easy to read page, make sure you blip this page from your smartphone.

(PRODUCT LAUNCHES)

ASUS ZENPAD Z8



Asus' ZenPad Z8 features a 7.9-inch IPS 2K display and is powered by a 1.4GHz Snapdragon 650 SoC. You also get 2GB of RAM and 16GB built-in storage. It's backed by a 4680 mAh battery and a USB Type-C port. Price: ₹16,500 (approx)

LG MOSQUITO AWAY TV



LG's new range of 'Mosquito Away TV series' acts as a mosquito repellent in addition to being an entertainment centre. Starting from 32-inch, the TV is equipped with an Ultra Sonic device to keep mosquitoes away. Price: ₹26,900

LENOVO PHAB 2 PRO



PHAB 2 Pro is the first phone to come with Google's Tango which can detect physical objects in an AR setup. It runs on a Snapdragon 652 Processor with a 6.4-inch screen along with other flagship level features. Price: ₹34,000 (approx)

PICTURE PUZZLE



ABSOLUTE TIMEPASS

UNJUMBLE ON YOUR MOBILE



DOWNLOAD BLIPPAR APP ▶ FILL SCREEN WITH IMAGE ▶ BLIPP IMAGE INTO LIFE!

Top 3 YouTube Picks

Make sure your bosses don't catch you goofing off watching one of these videos playing on your screen



Gigabyte factory tour
Duration: 26:48

Gigabyte welcomed a bunch of vloggers to one of its factories to show how it manufactures all of those components. <http://dgit.in/GigabTour>



The Transit Elevated Bus
Duration: 01:00

China's new Transit Elevated Bus (TEB) allows cars to pass underneath, increasing utilisation of road space. <http://dgit.in/ChTEB>



The floating Tesla
Duration: 00:44

Thought the future electric cars would break down when it came in contact with water? Think again. <http://dgit.in/TesH2O>



Researchers build
1000 core processor
<http://dgit.in/1000cores>

Looking back at you

>>After years of you looking at the web, now the web is ready to look back at you> by Koustav Ray

Introduction

Eye and gaze tracking have been the domains of high end technology for a long time. But in the first week of June, computer scientists from Brown University have released a javascript library titled WebGazer developed by them that brings eye tracking within the reach of anyone with a website. Using the webcam of the computer or front cameras on mobile phones, this could be used by website owners to understand their users' areas of interest better and provide them content aligned with those interest areas in real time.

The eye tracking model is based on self calibration by analyzing the pattern of where the user is looking when he clicks a particular location on the website. The entire development has two main parts - a pupil detector that can be used with any eye detection library and a gaze estimator that uses regression analysis based on user interactions. This allows the software's self calibration to go on while the user is browsing the web. The images collected by the webcam during such browsing sessions can be analyzed to store what the user's eyes look like. After this, similar interactions will also be stored and the two will be compared to understand the relationship between eye features with respect to on-screen gaze location. This will allow the gaze to be tracked even when the user is not interacting.

That being said, that is not the only way in which WebGazer tracks the gaze of the users. The second one treats the eye as a multi-dimensional feature vector and combines user interactions with regularized linear regression. This goes beyond the usage of clicks for tracking, it also takes into account cursor movement and eye-cursor coordination delay as vital inputs to estimate the gaze accurately.

The relative simplicity of WebGazer might be its strongest suit. It has no 3D capabilities that render it light and easy to implement into any browser and website. It makes up for the loss of accuracy there by constant calibration. Along with that, the constant calibration removes the need for any initial calibration session and lets the user be free to move during any tracking. Pretty soon, it might become internet norm to have websites tracking your gaze, quite like the crawlers of today

Getting WebGazer:

The entire WebGazer library is a simple javascript file available for download on their website.

To get it, simply go to <https://WebGazer.cs.brown.edu/#download> and download the file onto your machine. When using the library on a webpage, do remember to include it by including it as follows:

```
<script src="WebGazer.js" type="text/javascript" >
```

*Coding Matters



*"Google and Udacity launch Android course"

>> Android basics nanodegree launched for beginners with zero coding experience.

<http://dgit.in/UdaAndroid>



*"RedEye gives your phone 24x7 vision"

>> New technology to give computers intelligent vision that remembers specific things.

<http://dgit.in/RdEye>



*"ECMAScript 2016 approved"

>>Also known as JavaScript 1.9 and ES7, yearly release of ECMAScript with couple of new features .

<http://dgit.in/ECMA2016>

WebGazer Features:**Eye Tracking:**

WebGazer uses the already available webcam on laptops, and front camera on mobiles to track the eye movement of the user by calculating the movement of the eye pixels at regular intervals.

It includes a number of computer vision algorithms known as tracker modules. These are used to determine how the information of eye movement should be calculated. The three standard tracker modules that ship with WebGazer.js are .cmtrackr, js_objectdetect, tracking.js. However, other algorithms can also be configured allowing for higher degrees of customization.

Machine Learning:

The library continuously tracks user clicks and mouse movements and then uses the information to self-calibrate itself, improving the accuracy of prediction of eye movements.

It uses a regression model to process the input.

Just like tracker modules, a number of regression modules are available for developers to choose from, like:

- ridge
- weightedRidge
- threadedRidge
- linear

Browser Support

WebGazer uses the Stream API that is supported in most major browsers. These include

- Chrome 47 and above.
- FireFox 44 and above
- Opera 36 and above
- Microsoft Edge 13 and above

Applications:

An efficient eye tracking tools has many applications and it is only limited by the capabilities of the hardware. Some of the significant ones are:

- **e-Commerce** - Online shopping information is one of the goldmines that almost every e-commerce sites track these days using crawlers and other means. But that highly relies on you actually interacting with the website, which might not always be the gaze. With this library, such ecommerce websites will now be able to track where you are looking, which product holds your gaze longer, what are the things you notice first on a product page and what gets ignored.
- **Advertising** - The principles of e-commerce also apply to online advertising in terms of tracking. An advertiser would definitely want to know if people are even looking at his ads, whether they are actually ignoring it or is it catching their eyes. This also helps website owners to place ads better so that they receive more attention. With possibilities of dynamic generation, analysing a gaze pattern over time might even lead to targetted advertising, with a website loading differently for users with different gaze patterns.
- **Gaming** - The ability to track the gaze opens multiple new doors for gaming. A player can analyze their gaze pattern over multiple matches to know where they are going wrong or figure out weak spots. It would be handy if you can figure out your blind spots in Dust II, wouldn't it? Although there are other

gaze tracking technologies, the lightness of this makes it ideal for gaming, where performance needs to be optimum. Beyond self analysis and improvement, gaze tracking in gaming can be a completely new method of interaction. Consider this, you are playing a highly detailed single player game and an object catches your attention. Gazing at it ingame brings up detailed information and a zoomed in view of the object. These are only a couple of possibilities and there are endless new ways to game with this.

- **Virtual Reality** - If there is one area that can benefit endlessly from gaze tracking it is Virtual Reality. Even though there aren't really any mainstream websites that are completely VR enabled, mobile VR already tracks the zone you are facing long enough to detect that as a click. With advanced gaze tracking, it is highly likely that simple interactions like scrolling, zooming in, minimising and maximising can be done via gaze changes. Also, since rendering VR can be quite tasking for most processors and GPU's, especially when it is within a browser, it might make sense to restrict high quality renders to the area where the user is looking.

Disadvantages:

Since this tool essentially democratizes tracking, there are several possible concerns:

- **Privacy** - We do not need to tell you explicitly that giving access to your webcam might open doors to hackers, letting them see you and your surroundings, but we still will. Unless you are completely sure of the websites credentials, or a completely new and reliable certificate based on this is released, it would probably be wise to grant access quite rarely.
- **Performance** - Any device, irrespective of how light and resource friendly it is, does have a lifetime. WebGazer essentially takes control of your webcam continuously, constantly recording the frames and analysing them to get a better estimate of your gaze. Unless you have a really high quality webcam, this might lead to an early demise of that device.
- **Accuracy** - Technically, we do look at what we are interacting with online, but it is not always completely precise. WebGazer can at the most get an estimate of the general area we are looking at for quite a while as of now. Even if it could precisely pinpoint the location of the user's gaze, it might not necessarily be the exact thing we are interacting with and that parameter would vary from website to website.

Creating The WebGazer.

Here we create a simple program that uses WebGazer to generate a heatmap of the user over a period of one day

STEP 1. Create a simple HTML Page with a button in it which onclick will call a js function named "stopTracking".

```
<button onclick="stopTracking()" > Stop Tracking </button>
```

STEP 2. Include the WebGazer.js (<https://WebGazer.cs.brown.edu>) and simpleheat.js (<https://github.com/mourner/simpleheat>) in the html file.

```
<script src="WebGazer.js"></script>
<script src="simpleheat.js"></script>
```

STEP3. Now add the following snippets in a script:

3a. Set the regression and tracker modules:

```
window.onload = function() {
  WebGazer.setRegression('weightedRidge')
  //different regression modules can
  be used.. Refer documentation
  .setTracker('clmtracker') //three trackers are
  available by default, refer documentation
  .setGazeListener(function(data, clock) {
    /* data: is an object containing an x and y
    key which are the x and y prediction coordinates
    (no bounds limiting) , clock: elapsed time in mil-
    liseconds since WebGazer.begin() was called */
  })
  .begin()
  .showPredictionPoints(true); /*
  shows a square every 100 millisec-
  onds where current prediction is */
}
```

3b. The Setup with the video in a frame can be done as follows:

```
var width = 320;
var height = 240;
var topDist = '0px';
var leftDist = '0px';

var setup = function() {
  var video = document.getElem
  entById('WebGazerVideoFeed');
  video.style.display = 'block';
  video.style.position = 'absolute';
  video.style.top = topDist;
  video.style.left = leftDist;
  video.width = width;
  video.height = height;
  video.style.margin = '0px';

  WebGazer.params.imgWidth = width;
  WebGazer.params.imgHeight = height;

  var overlay = document.
  createElement('canvas');
  overlay.id = 'overlay';
  overlay.style.position = 'absolute';
  overlay.width = width;
  overlay.height = height;
  overlay.style.top = topDist;
  overlay.style.left = leftDist;
  overlay.style.margin = '0px';

  var myCanvas=get('canvas');
  myCanvas.width=screen.width;
  myCanvas.height=screen.height;

  document.body.appendChild(overlay);
}
```

*pointers

>>Interesting PHP developer videos



*WebGazer Demo

>>A demonstration of WebGazer by Alexandra Papoutsaki, one of the developers of the library.

<http://dgit.in/WebGzer>



*Udacity Javascript

>>Udacity's extensive playlist on Object Oriented Javascript covering basics as well as moderate level concepts.

<http://dgit.in/JSTutUda>



*Google I/O - V8

>>Seth Thompson, Associate Product Manager, Google talks about improvements to Chrome's V8 engine in processing Javascript.

<http://dgit.in/GooglV8>



*Generators in JS

>>All about Generators, also known as co-routines, which are pausable functions in JavaScript, used to manage async operations

<http://dgit.in/JSGens>



```
var cl = WebGazer.
getTracker().clm;
function drawLoop() {
  requestAnimFrame(drawLoop);
  overlay.getContext('2d').
  clearRect(0,0,width,height);
  if (cl.getCurrentPosition()) {
    cl.draw(overlay);
  }
  drawLoop();
}
```

3c. Now let us check if Webgazer is ready and call the setup method as defined previously:

```
function checkIfReady() {
  if (WebGazer.isReady()) {
    setup();
  } else {
    setTimeout(checkIfReady, 100);
  }
  setTimeout(checkIfReady,100);
} //The window.onload function
which we started in step 3a ends here
```

STEP 4. Optionally save the data into local web storage or clear it as you wish...

```
window.onbeforeunload = function() {
  WebGazer.end(); //Saves the
  data even if you reload the page.
  //window.localStorage.clear(); //
  Uncomment if you don't want to save
  data across different sessions
}
```

Stopping the Webgazer and Creating a Heatmap

STEP 1.

Define the stopTracker function that is called on clicking the button

```
/*Helper Function*/
function get(id) {
  return document.getElementById(id);
}
function stopTracking()
{
  WebGazer.end(); //Save Webgaze Data
  var dataset=JSON.parse(window.
  localStorage.WebGazerGlobalData); //
  Read Data from Local Webstorage
```

```

|
| //create data in the form of "simpleheat" input
| var data=[];
| for(var i=0;i<dataset.data.length;i++)
| {
|   data.push(dataset.data[i].screenPos);
| }
| //Hide the Video Overlay
| get('overlay').style.display='none';
|
| //Display The Heat Map
| get('canvas').style.display='block';
| generateHeatMap(data);
| }

```

STEP 2.

Define the generateHeatMap function that renders the heat map and hides the video overlay

```

function generateHeatMap(data){
/*A heat map generator using "simpleheat.js" (https://
github.com/mourner/simpleheat) to show your most
viewed areas in a heatmap representation*/
window.requestAnimationFrame=
window.requestAnimationFrame|| window.
mozRequestAnimationFrame||
window.webkitRequestAnimationFrame
|| window.msRequestAnimationFrame;

var heat = simpleheat('canvas').data(data).max(18),
frame;
function draw() {
console.time('draw');
heat.draw();
console.timeEnd('draw');
frame = null;
}
draw();
}

```

Inferences:

- The tracking modules are a bit difficult to work with, clmtracker was the fastest of the lot, while trackingsjs was relatively slower and less accurate.
- The different regression models tend to learn at nearly the same pace with the threaded Ridge model being the fastest (as data training was on a separate thread).
- Even with 2-3 hrs of training we were unable to achieve less than 500 pixel accuracy of gaze prediction.

Conclusion:

Computer vision is a rapidly expanding field in the science of computing with amazing potential.

WebGazer seems to be a unique way to leverage it in an attempt to better understand user interaction and interest, that can in turn help us to further enhance user engagement as well as interaction.

The possibilities for WebGazer seem to be endless, from better understanding user choices and interest on an eCommerce website to gaze based interaction in gaming. Even in mobile applications, WebGazer represents an easy way for developers to harness a new way of user interaction. It can prove to be as disruptive in its innovation as VirtualReality and even more widespread because of its simplicity. However the ethical concerns of allowing an application to access your webcam to 'see' you and your surroundings are significant. Such permissions would only be reasonable for completely trustworthy websites or apps and even then would be hard to acquire.

Although both Computer Vision and machine learning are pre-existing technologies, this library is probably the first attempt to combine them in such a novel way. But above all it is the simplicity and ease of use of this javascript library that makes it a truly unique and democratized tool.

With the advent of dedicated vision processing units, this development might lead to interesting possibilities in the fields that we discussed earlier. A computer that can actually see, might be able to do a lot more with the ability to estimate your gaze. From extremely realistic human-machine interaction, to machines that can actually tell when you are having trouble focussing on your work, the machines of the future can and will truly look back at you.>

*Nodes of Interest



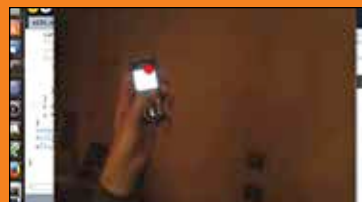
*"Coursera - IBM \$2.4 million funds for startups

>> 20 entrepreneurs to receive \$120,000 in IBM Cloud credits
<http://dgit.in/IBMCrsera>



*"JavaScript from Beginner to Expert

>> 30 day course from Udemy to become front end web developers.
<http://dgit.in/JSUdemy>



*"Light tracking and Air drawing

>> Tutorial for object tracking and using light to draw based on webcam.
<http://dgit.in/AirDraw>



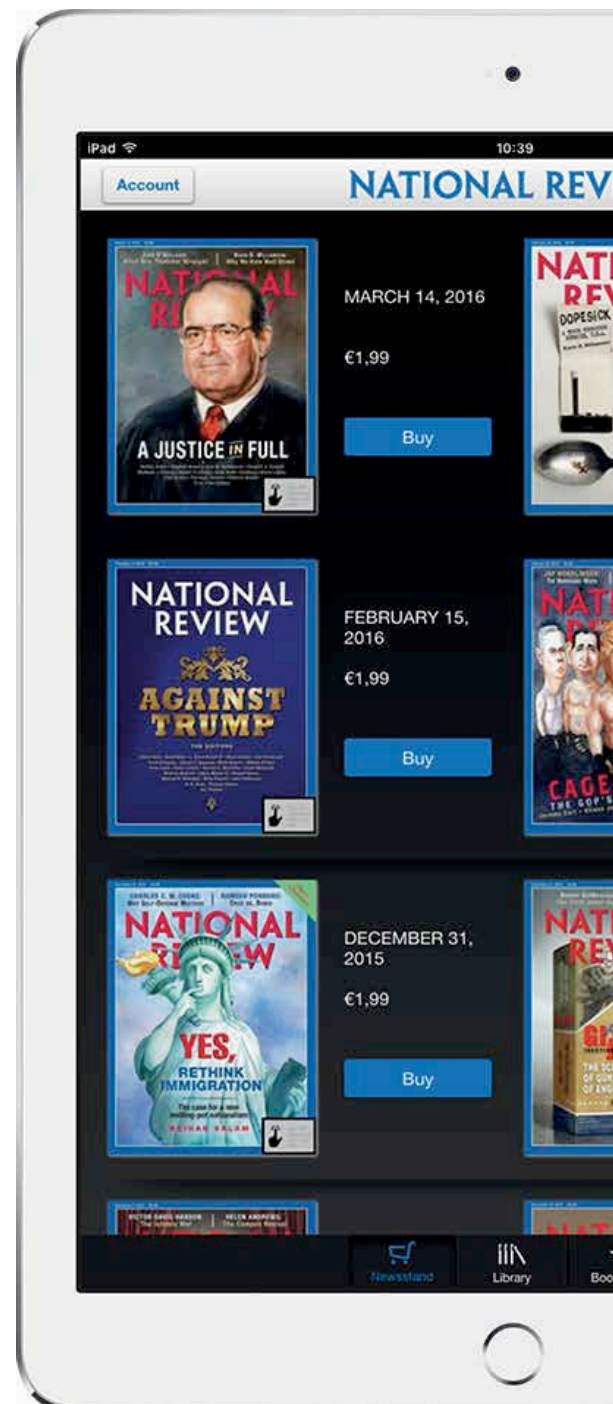
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Tips & tricks

Looking for ways to stay completely anonymous while browsing online? We'll show you the way



Drones deliver pills

Activists in Northern Ireland used a drone to deliver abortion pills. <http://dgit.in/DrnDlvry>

Linux for all, weird SMPS, and the ever-popular SLI question

From simple fixes to expensive replacements – our readers have problems and we have solutions.

Hidden Networks

I am connected to the Internet via a Wi-Fi router. I need to make it visible to only my pc. Other people keep trying to access my Wi-Fi. So please tell me a solution to make the Wi-Fi connection only visible to my PC. My Wi-Fi router is TP-Link.

–Avinash Sharma

A What you've asked is one of the most basic steps that anyone should perform while setting up a Wi-Fi network – hiding the SSID. The make of your router doesn't



Hide your SSID

matter since this is a very basic feature that is present in all devices. Simply login to your router using the pre-defined IP address, provided you haven't changed it. It's usually 192.168.1.1 and the user ID and password are both usually "admin", and in some cases the password might be "password". Once you're logged in, you can navigate to the Wireless tab and right there in the basic settings you'll see the options "Enable Wireless" and "Hide SSID Broadcast". Ensure that both these options are checked. Click on Save/Apply and you're all set. Some settings might require you to reboot the router but that's pretty much all there is to it. Next time onwards whenever you try to connect to your router, you will have to manually enter the SSID as your router will no longer be listed among the visible IDs.

You'll have to go with "Connect to a Hidden Network" and then proceed with the WPA/WPA2 key for authentication.

Starting with Linux

I am very interested in programming and Linux and so thought about setting my own Linux machine using my old PC. Here are the specifications:

- CPU: Intel Pentium 4 Single Core - 2.66GHz
- RAM: 2 GB
- HDD: 180 GB including Windows

Partition + 1 TB external for storing important Files and extra software backup.

I had set up an Arch Linux installation but due to slow internet connection I removed it and thought about Ubuntu since we have an software server cache which is quite fast (about 5 MBps). So the main requirement of this OS will be Programming. The

secondary objective is for it to be easy for my parents to use basic services such as internet and Skype as they have absolutely no tech knowledge.

I was thinking Kubuntu since it is very Windows-like but I think it will take my resources while coding. Do you think I can install a tilting windows manager such that it won't cause the default KDE to act weird and it should only work in my session.

Also can you point me to some powerful and lightweight IDE, I used Geany in windows but I didn't like its interface but if I can change its theme in Linux then I will be happy. I am learning Python and would later want to learn C/C++ and Java.

–Asbin Dahal

A There are a couple of questions here so we'll tackle them one by one:

- 1) **Recommended OS:** We wouldn't recommend Arch. If you want a more windows-like UI, you should also consider Lubuntu which uses LXDE. The successor to LXDE, LXQt is also a great lightweight desktop environment. Alternatively we personally use openSuse and would recommend it, but it will suffer from the same issue of having slow download speeds. Kubuntu / Lubuntu is still fine though.
- 2) You can also add a separate desktop environment for coding. For instance we currently run KDE Plasma and also LXQt, icewm, and Openbox. We don't know about the default system used by Kubuntu / Ubuntu, but you can install LightDM or SDDM which allow you to pick which desktop environment you want to use while logging in. In this case you can use a tiling window manager separately. Plasma (KDE's desktop environment) allows you to select which window manager to use. So you can use a tiling window manager like Awesome with Plasma if you want. But 2GB RAM is a bit on the low side to be running Plasma 5.
- 3) **For IDE:** For Python we recommend Pycharm, it has a free open source version as well. But 2GB RAM might



Lubuntu - Windows-Like



NASA Apple TV app

NASA will let you check on the space station and stream launches live.
<http://dgit.in/NasaTVApp>

Q&A

not be enough. While it's more famous in the scientific python community, Spyder is a good Python IDE. Other IDEs for Python are eric and NINJA. For C / C++ you should consider QtCreator. It's mainly for Qt projects but works just fine for plain C / C++ projects as well. The KDE community also has an IDE called KDevelop which is quite good and can work with Python and C++ among other languages. For Java I recommend IntelliJ IDEA, they have a free open source version available.

IDEs these days are quite RAM-heavy though, so you might want to consider something like Sublime Text, which is paid mind you, or Atom. Or just go the pure unix way to learn Emacs / Vim, they both have tonnes of plugins that add support for code intelligence and syntax highlighting etc, check out vundle for vim and spacemacs for emacs.

To SLI or not to SLI

Hey Digit! Thank you for answering that question about future-proof gaming machine. And here's another question for



2x GTX 960 in SLI

you I hope you would answer this as well. Which would be best?

- Using SLI With two GTX 960 (currently I am having only one GTX 960)
- OR
- Buying new a graphic card (which one to buy)

Thanks digit

—Yogesh Thakur

Since you already have a GTX 960, you can get another GTX 960 and SLI them together to get performance that nearly approaches that of a GTX 980. As long as you are playing on a 1080p display, this arrangement is all you need to go for. There are very few games that will prove to be taxing so this arrangement will be

sufficient for a good 3-4 years. You might notice stuttering and other artifacts every now and then with a new game but as soon as the Game Ready Drivers are released, you will have a much smoother gaming experience. However, if you are interested in VR then you might want to keep an eye out for the AMD RX 480.



Corsair VS450

Weird UPS

My computer sometimes shuts down for a fraction of second and then restarts at the time of a power outage. The weirdest thing that happens is that when I switch off the electric supply of UPS (ie. where the UPS is connected to socket), the power back-up function keeps running the computer normally, I mean without any reboot happening. But when there is power outage the computer restarts, this issue has only begun after I changed the power supply. I'm using a Corsair VS450. What may be the reason?

—Ben Ngaihte

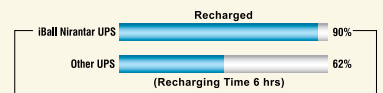
Hey Ben, since you mentioned that your PC restarts whenever a power outage happens, we're assuming that you have an power inverter which is switching on. During such a switch, there is a slight glitch in the power waveform which follows through into the PSU since the UPS doesn't switch to battery backup. This matters because there are certain SMPS that require a clean sine waveform. Power supplies like the Corsair VS450 have something called APFC (Active Power Factor Correction) which requires a pure sine wave to function properly. There are certain power supplies that can work with stepped up sine waves but most don't. So you can either switch the inverter or the SMPS. Doing either should solve your problem. **!**



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Secunderabad: 27894847, Vijaywada: 9248233668

HOW TO STAY ANONYMOUS ONLINE

When it comes to our privacy and security we're all a bit paranoid, as is our right. Our privacy online can be compromised just as easily as our privacy in real life. Being completely anonymous in times like this can be a struggle, but we're here with a few useful steps which you can use to stay anonymous online.

Choose the right OS:

When it comes to operating systems the first two that pop into our heads are Microsoft Windows and the Mac OS. However, these aren't the only operating systems available in the market and they're far from the most secure. Switching to Tails can be a wise move if you are concerned about your privacy online. Tails is a live operating system, which can be started on almost any computer by means of a DVD, USB stick, or SD card. All connections made through this OS



are forced through the Tor network, thereby making all your connections considerably more secure. This OS comes with pre-installed cryptographic tools for emails and encrypts your files and messages for that extra bit of security.

Link: <http://dgit.in/Tails-Install>

Adapt Tor:

If it's secure online communication you want, then nothing can beat Tor. Traffic



How to stay anonymous online35
Circumventing region restrictions.....36

{ Tips & Tricks has its own page numbers, and does not follow the rest of the magazine's page numbers. This is done to ensure that you can cut out and save T&T in a separate folder for later reference. }

analysis is a kind of network surveillance that compromises personal freedom and privacy. It is the biggest obstacle when it comes to achieving total online anonymity. They're like those neighbours who keep poking their noses in when they have no business there. Tor is a free software which will help you save yourself from traffic analysis. Simply put, Tor is basically a system whose sole purpose is to ensure that you and your internet connection remain anonymous.

Link: <http://dgit.in/PrjctTor>

Ditch Plugins:

It's not something that's commonly known, but all the plugins that we use on a daily basis to enhance our day to day surfing experience often leave behind a track of clues or a digital footprint. These digital clues or footprints can then be used to track your location and identity. While in most cases only harmless information is tracked and stored, if you're actually under threat or being hacked by a professional, he simply needs to track these clues or digital footprints left behind by your plugins to gain more information about you. So



if you mean serious business and want a completely anonymous browsing experience, you should get rid of those plugins.

Trust only HTTP/S:

For those who know nothing about HTTP, it stands for Hypertext Transfer Protocol. HTTP is the technology protocol that decides how your web browser responds to commands and the how messages are sent and received. HTTPS on the other hand stands for Hypertext Transfer Protocol Secure. That additional S in HTTPS actually makes a big difference when it comes to your privacy and



security while browsing. What this means is that HTTPS is the encrypted and more "secure" version of HTTP. With a little help from a browser extension, you can force web pages to use only HTTPS, even if they are designed to use the less secure and unencrypted HTTP.

Make your money anonymous:

Using Bitcoins as a currency has become a trend of sorts, but have we ever wondered if it was trackable or invisible? We highly doubt it. Darkcoin, which is now known as Dash, is an open source digital crypto-



graphic currency, and yes we're aware that Bitcoin also calls itself the same thing but Darkcoin simply does the "crypto" part better. Darkcoin is basically anonymous Bitcoin. It's based entirely on Bitcoin's software code, which is claimed to be the world's first cryptocurrency. However, finding merchants can be a total pain sometimes. So here's a link that might help you out

Link: <http://tinyurl.com/qzo398u>

Install a Cookie destroyer:

For those of you who aren't familiar with what cookies are or are maybe thinking about the wrong kind of cookies, let us make it clear right away, we aren't talking about the edible kind. Cookies are tiny bits of code that are automatically downloaded to your system when you browse a website. It's pretty obvious that your



online activity can be tracked with the help of these cookies. Every website you visit downloads tiny tidbits of data onto your system, and you can't even disable cookies as many websites need you to allow cookies in order to properly access them. In most cases, cookies are harmless and don't really pose too much of a threat. But every little bit helps, especially if your goal is to be completely anonymous. Deleting all of your cookies is one step closer towards that goal. Applications like CCleaner will help you delete all the cookies you've piled up in your system from browsing, so it might be advisable to delete your cookies regularly. Deleting your cookies can also improve your system's performance, yet another reason for you to make a habit out of it.

Find the right smartphone:

Would you be able to live an entire week or two without your smartphone? We're all pretty much hooked to this piece of technology and it can be quite tricky when it comes to being anonymous while using our



phones. The browsing experience on a smartphone can be completely different for some when compared to browsing on say a desktop or a laptop. Most people aren't even aware that they can easily be tracked while browsing on their phones as well and therefore don't take any precautions when it comes to privacy or anonymity. If you seek a smartphone that boasts a completely safe and anonymous browsing experience, the Blackphone 2 is your answer. This phone will keep you invisible from the prying world.

Use the right browser:

We're all familiar with the mainstream browsers like Google Chrome, Mozilla Firefox, and even Microsoft Edge. Let's



not forget Internet Explorer, we should respect our elders. But jokes aside, when it comes to online browsing, everyone uses one of these. But are they secure enough? Or are you leaving behind easily trackable digital clues and footprints? In that case, switching to browsers which primarily focus on online security and anonymity is what you need to do next. Using browsers like Comodo Dragon or Dooble might be a wise idea if you want to live an invisible life.

Tweak your Emails:

Most of the popular email services are not exactly privacy friendly. And while all prominent mail services, such as gmail and yahoo mail for example, do offer some kind



or form of encryption, complete anonymity and privacy is not something they heavily tend to focus on. If it's privacy you're looking for, Hushmail beats them all. Hushmail provides you with a private email account, and as an added bonus, it's completely ad free. The email comes with unlimited email aliases and has built-in encryption. Another option would be use temporary email services. These will allow you to keep your identity private or invisible and provide you with burner or disposable email ids. Some popular disposable email services such as Mailinator are worth checking out.

Check for Trackers:

Every website you visit tracks and collects data when you perform any online activities. And the scary part is in most cases the user is can't even detect when the tracking is happening. Ghostery is a free



browser extension which shows you when a website is tracking you. So you can keep track of the tracker, literally. With the aid of this extension you can pretty much check on which web bugs are tracking you and which ones are or could be potentially harmful and should be blocked.

Use a VPN:

We have covered this topic very extensively in our previous issues, but once again for those who don't know what a VPN is, it stands for Virtual Private Network. What this does is it hides your IP address and runs all of your online data through an encrypted virtual tunnel which has your data secured. An additional benefit



to using a VPN is it allows you change the location from which you're browsing as well. So you can make yourself appear to be browsing from another country, or access websites that may otherwise not have been accessible in your own country. There are several VPN services available such as TorGuard, HideMyAss, and CyberGhost to name a few.

CIRCUMVENTING REGION RESTRICTIONS

The world's favourite pastime of watching Television, isn't really much of a favourite right now. We've all moved on to online streaming. Most of us now stream online, because of the advantages that come with it. Makes sense, it's simply far more convenient. However,

there is a problem that we're sure most of us must have come across at some point of time. The problem of content being region-restricted.

If you happen to be in this situation, fear not, VPN is to the rescue. If you want to access content that is US based you'll need to be able to access a server from there with good download and upload bandwidths. There are many who provide this service for free, however, they compromise on bandwidth. You'll have to pay for the service if you don't want to make any compromises. It's also advised that you only use them when needed and not while browsing casually.

Adapt Paid VPN Services- Private Internet Access

You can go one step beyond VPN and try a Private Internet Access. This is a paid service which will let you browse all sorts of content without any restrictions or worries about regional restrictions. Private Internet Access supports OpenVPN, PPTP and L2TP/IPSec protocols. It provides users with access to private DNS servers as well.



Steps to implement Private Internet Access:

- Register for a free account
- Click on 'Go to Setup' under the action menu.
- Choose your operating system and router type.
- A Step by Step manual will pop-up.

Switch your DNS

Changing the DNS server on your home router can get you access to a lot of services which work through DNS. When you access a geo-blocked website, your DNS will redirect the traffic through a tunnel, making the server believe that you are accessing the website from the appropriate country. You can use software like QuickSetDNS to quickly switch between DNS addresses and use services like

Unblock-US to switch to third party DNS services.

Steps to take to switch your DNS:

- Click on "Open Network and Sharing Centre"
- Click on "Change adapter settings"
- Right Click on the icon that says Ethernet < Click on "Properties"
- Click on "Internet Protocol Version 4"
- Click on " Properties"
- Change the DNS to your desired one.

Make use of a Proxy

With the help of web-proxy services all browsing traffic is redirected through a proxy server, tricking the blocking software into thinking you're connecting

to a legitimate website. There are multiple websites which list proxies that can be used. Proxy.org is a great place to start your hunt. Proxies that are overused and well known by everyone get noticed and blocked often, so be wary of the ones you use. Hidemyass.com is also a good example of a proxy service.

Install Browser Extensions

Hola Better Internet previously known as Hola Unblocker is one the most popular services which provides free access to geo-blocked websites. It provides you with a browser extension for Chrome and Firefox through which you can change your country to the desired one with just a few clicks.

Steps to using Hola:

- Click on the Hola icon on the browser toolbar and then select the desired country.

Link: <https://chrome.google.com/webstore/detail/unlimited-free-vpn-hola/gkojfkheikighikafcpjkikifbnlmeio?hl=en>

Use Smart DNS Proxies on Chromecast

You can stream restricted videos on Chromecast using Smart DNS proxies. This allows you to access unrestricted channels and websites on your Chromecast. Smart DNS only redirects parts of your connection and doesn't slow down your internet speed. This primarily works best when you want to stream US based Netflix content on your Chromecast, this service doesn't change your local IP address which means you still have access to all your local websites. Also Unlocator offers various tutorials and videos which help you go through the whole process of setting this up.

Link: <https://unlocator.com/>



Accessing geo-restricted data on Chromecast

Changing the DNS setting of your router

Your Android smartphone extracts DNS service information from your router, so if you've made changes to your router's DNS settings, your phone will start using the same unrestricted DNS services. This is the easiest option to go with.



Changing the DNS setting on your Unrooted Android phone

If you are unable to change your router's settings, you can try changing your Android's connection settings to use a custom DNS setting, this can be a bit irritating because you will have to change the DNS settings

manually for each and every Wi-Fi network you connect to.

Changing the DNS setting on your Rooted Android phone


If you happen to have a rooted android smartphone, you've saved yourself a boatload of

trouble. Just install the Set DNS app. This app forces your phone to use the custom DNS server. This will automatically enable each and every time you connect to a new Wi-Fi network.
Link: <https://play.google.com/store/apps/details?id=uk.co.mytechie.setDNS&hl=en>

Downloading region-restricted apps

Let's assume that you want to download an application, such as Spotify for example, which is available only to most of Europe, the Americas and Oceania. If you want to have access to such content legally in India, here's what you need to do.

Steps for downloading region-restricted apps:

- 1) Sign out of your iTunes account. Scroll down to the bottom of the store.
 - 2) You will see a little flag representing your country. You can click on that to change it to the desired country.
 - 3) Search for any free application you'd like to download from the store, and click to purchase.
 - 4) You will have to create a new account and provide your credit card credentials.
 - 5) Make a new account, at which point, you'll be prompted to provide a local address for that region, which isn't too difficult to do if you're resourceful. When asked for a payment method, select "None".
- Voila! You're done. 

SOMETHING EXCITING THIS WAY COMES

The Digit e-mag app is in the pre-beta phase.

Yes we know, we know it's been long overdue. But now that we're making some progress we're inviting our most diehard fans to join the pre-beta programme.



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**See Translation on Instagram**

Instagram may offer automatic translation of posts and comments with its next update, soon to rollout 'See translation' button. <http://dgjit.in/InstaTR>



VR'S THE WORD



Mithun Mohandas
mithun@digit.in

“Analysts” have declared every year since 2014 as the year of the VR and they’ve been proven wrong each and every time. Heck, that’s what an analyst’s job is – to be wrong 90 per cent of the time and be correct 10 per cent of the time, partly due to chance. We kid. But 2016 is truly the year of the VR. AMD and NVIDIA have both come out with pretty strong offerings to capitalise on the VR space. NVIDIA’s Pascal has already debuted with two flagships – the GTX 1080 and the GTX 1070 and by the time you get this issue, AMD will have its Polaris based RX 480, RX 470 and RX 460 out. The difference here is that NVIDIA’s offerings are really expensive and AMD’s aren’t so by the look of things, it seems that AMD is going to sweep the mid-range segment in the coming months. However, we’d rather not count all our chickens before they hatch, so we’ll wait till the actual launch to opine on the subject. Meanwhile, let’s look at what new technologies have come forth.

More buzz words!

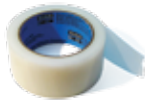
Let’s start with VR. NVIDIA had a head-

start with their GTX 970 and GTX 980 which were even cited by multiple VR headset manufacturers as the bare minimum and AMD’s offerings weren’t exactly making the cut. AMD then swooped in and stole the show with Project Quantum which had dual Fury X GPUs. Unfortunately, we never saw the unit here in India. So between the ridiculously priced 970s, 980s and the Quantum that never surfaced, 2015 was never cut out to be the year of the VR.

Come 2016, and we saw Pascal getting launched and it totally changed the ecosystem, at least, it did so overseas. The ridiculous pricing in India pretty much ensured that the GTX 1080 was a normal flagship launch and nothing spectacular. The GTX 1070, on the other hand, is a lot more favourable priced, overseas, that

is. And then it’s AMD’s turn. As the time of writing this article, we know that the RX 480 is priced at \$199 which works out to ₹14,000 and for that price it will be a remarkable GPU. Even if we bring taxation into the picture we are looking at roughly ₹18,900 for the RX 480. Unconfirmed leaks have shown the RX 480 to be really powerful with two in CrossFire even beating the GTX 1080 in certain DX12 games. So for ₹37,800 you’ll have, allegedly, a better GPU configuration than the GTX 1080 which costs ₹63,250. It sounds too sweet to be true and we’ll only know the full of it after the official launch.

Both AMD and NVIDIA have bigger bombs in their arsenal, NVIDIA has the GP100 of which they’ll probably release a GP106 or a GP204 and AMD has VEGA up its sleeve. There’s hardly ever been so much



Panaroyal Mark

Spending millions on his security, Mark Zuckerberg still chooses to tape his webcam, audio jack and microphones. <http://dgit.in/ParanoMark>



Couponhaat's app

Couponhaat's new smartphone app on Android and iOS lets you access discounts. <http://dgit.in/CHTApp>

[GPU comparison](#)

excitement in the GPU arena than now. It'll be at least four or five months before we see AMD and NVIDIA's flagships but till then we'll have to settle for the GTX 1070 and the RX 480. (Well, not settle exactly.)

Then there's the fact that both NVIDIA and AMD have moved to smaller transistor

sizes, NVIDIA with its 16nm FinFET and AMD going with 14nm FinFET. NVIDIA has been moving down the nanometer scale on a regular basis but this Polaris was AMD's transition after a really long time on 28nm. This has great implications on the power efficiency as smaller transis-

tors can operate at lower voltages and also generates a lot less heat. This means that AMD cards might finally shrug off the hot-head label but that's to be confirmed once we get the test sample.

Apparently, HDR is really blowing up. Both NVIDIA and AMD are really pushing

How We Tested

We test graphics cards for gaming performance, compute performance and then assess their build quality. With these three parameters quantified we then take the price into consideration to determine the performance per rupee value. India being a price conscious market is quite keen on getting more for the money. Another reason why value for money matters is we endure a lot of taxation and price-gouging, so the price-to-performance ratio is quite different than what these cards were initially priced at by their respective companies. And lastly, we check the build quality of each graphics card. With that done, we formulate scores and decide upon the winners across the categories. Read on to get a more detailed explanation of the benchmarks used.

Here's the configuration we went with for the test:

- **Processor:** Intel Core i7 4960X
- **Motherboard:** ASRock X79 Extreme 11
- **RAM:** 4x 8 GB Corsair Dominator Platinum CMD32GX3M4A2133C9
- **Boot drive:** 2x SanDisk Extreme II 240 GB SSD
- **Cooler:** Corsair H110i GT Liquid Cooler
- **SMPS:** Antec HCP-1000 Platinum
- **Monitor:** BenQ BL3201PT

Performance benchmarks

Synthetic

3DMark

No graphics card benchmark is ever complete without a few runs of 3DMark. The all rounder has multiple benchmarks for testing graphics cards from all segments, from flagships to entry-level kiddies. However, VR isn't 3DMark's strong suit owing to the fact that it doesn't take the headset into consideration. So we don't perform VR tests using 3DMark.

FurMark

Part of the OpenGL workload, this benchmark is

often called a power-virus which is not configured properly before running can cause your graphics card to heat up and go kaput. We use this to record peak load temperatures and power consumption, for obvious reasons.

LuxMark

LuxMark uses OpenCL framework to render a 3D scene and helps us benchmark a cards parallel processing abilities. Each run takes 120 seconds and the maximum number of frames rendered is considered the score.

API Overhead Feature Test

Still in the nascent stage, 3DMark's API overhead feature test benchmarks the GPU's ability to handle DirectX11, 12 and Mantle's API calls per unit time. Mantle may no longer be on the horizon but it gave rise to Vulkan which is the next big 3D graphics and compute API. We do not consider the scores towards our final calculations.

SteamVR

Steam's own VR Performance Test is a good way for you to allay your doubts over your graphics card's ability to handle VR devices like the Oculus or HTC's Vive.

Games

We've been testing graphics cards with a bunch of games and we retain our older game benchmarks just so that we can compare graphics cards across generations. The following games are part of our legacy suite.

- Bioshock Infinite
- Tomb Raider
- Sleeping Dogs
- Hitman Absolution

And then we have our updated suite which consists of the following games:

- DOOM
- Ashes of the Singularity

- Total War: Warhammer
- Witcher 3
- Rise of the Tomb Raider
- Fallout 4
- GTA V

Given the fact that we have limited space in the magazine, we only include one of these games for showing FPS scores. The remaining FPS scores can be found on the individual reviews when they're published online.

Build Quality

With changes in the GPU microarchitecture, the performance difference caused by a few MHz here and there don't matter. Even minor overlocks rarely show a difference in performance. So manufacturers have increasingly started focussing on improving the build quality of the graphics card to justify higher prices. The cooler is of prime focus here. Having a large enough heat sink, durable and silent fans bearings, improved fan fins, vapour chambers, etc., all contribute towards a better graphics card. Some manufacturers take the extra pain to add RGB which we consider purely cosmetic but there are those who modify the PCB to add more power phases to enable a precise current flow for overclocking. Those are taken into consideration as well.

Value for money

The total performance score generated by a particular card is divided by the cost of the card to deduce the performance/rupee factor. Often this leads to the most cheapest card in the lot being picked as the card that offers the most value for your money. However, this parameter also helps decide between close competitions as cards with the same GPU often end up being very close in terms of performance. This is where the VFM comes into the picture and decides the winner.

GPUs ABOVE ₹15,000									
		NVIDIA	GIGABYTE	GALAX	MSI	ZOTAC	GALAX	GALAX	
Model		GTX 1080	GTX 980 Ti XTREME Gaming	GTX 980 TI HOF 4GB DDR5	GTX 980 Ti Gaming 6G	GTX 980 AMP! Extreme	GTX 980 HOF 4GB DDR5	GTX 980 4GB DDR5	
Price		₹63,250	₹59,250	₹58,000	₹54,875	₹50,374	₹48,000	₹44,000	
Performance		90	87	88	87	66	72	65	
Value for money		54	56	58	61	50	57	56	
Build quality		83	60	90	90	68	60	75	
Warranty (years)		NA	3	3	3	5	3	3	
FEATURES									
Chipset		GP104	GM200	GM200	GM200	GM204	GM204	GM204	
Engine Clock		1607	1241	1190	1279	1291	1304	1127	
Memory Clock		1251	1800	1753	1753	1800	1753	1753	
Stream processors/Shaders		2560	2816	2816	2816	2048	2048	2048	
Texture Units		160	176	176	176	128	128	128	
ROPs		64	96	96	96	64	64	64	
Memory (MB)		8192	6144	6144	6144	4096	4096	4096	
Ports - VGA/DVI/HDMI/Mini-HDMI/DP/Mini-DP		N/Y/Y/N/3xY/N	N/Y/Y/N/3xY/N	N/Y/Y/N/3xY/N	N/Y/Y/N/3xY/N	N/Y/Y/N/3xY/N	N/Y/Y/N/3xY/N	N/Y/Y/N/3xY/N	
External Power		8-PIN	2x 8-PIN	2x 8-PIN	2x 8-PIN	8-PIN + 8-PIN	2x 8-PIN	2x 6-PIN	
Physical									
Temperature (C)									
	Idle	30	31	29	29	35	30	27	
	Load	73	68	67	69	65	62	79	
Wattage (%)									
	Idle	5.4	5.8	5.9	5.7	5.9	5.6	8.3	
	Load	92	88.4	89.8	88.65	80.6	78.2	100	
Synthetic									
3D Mark									
Fire Strike	Score	16452	15940	16029	15863	12141	13164	11798	
	Graphics	21535	19688	19720	19766	14172	15735	13869	
	Physics	13420	12974	12973	12985	14038	12957	12977	
API Overhead									
DX11 Single Threaded		NA	2528567	2522352	2528567	2533307	2533294	2542565	
DX11 Multi Threaded		NA	2431254	2447855	2431254	2442719	2442637	2446358	
Mantle		0	0	0	0	0	0	0	
DX 12		NA	19486312	19485978	19486312	19437793	19437752	17469704	
Steam VR									
Average quality		11	11	11	11	10	10	8.6	
Frames tested		14058	13464	13479	13464	10218	10216	9590	
Frames below 90 FPS		0	0	0	0	0	0	0	
Frames CPU bound		0	0	0	0	0	0	0	
Games									
Tomb Raider	Ultra	142.2	127.9	127.9	127.9	104	104	104	
	Medium	426.5	373.8	373.8	373.8	330.7	330.7	330.7	
	Low	541.3	502.2	502.2	502.2	454.3	454.3	454.3	

for HDR displays. Even at their respective conferences both companies demoed the HDR prowess of their cards. With 10-bit colour rendering for every workflow we are looking towards monitors reproducing images closer to real life. It'll be a while

before HDR monitors of that calibre end up being affordable but that's where we are heading. NVIDIA came up with Ansel, Simultaneous multi-projection, FastSync and AMD has LiquidVR, TrueAudio Next and GPUOpen. We don't have enough real

estate to go through all of them here, moreover, you can read what we've written about all of these technologies.

And lastly, we have Async Compute. In parallel processing, the best possible outcome would be achieved if the GPU

	ZOTAC	XFx	Power Colour	XFx	GALAX	ZOTAC	GALAX	Sapphire	GIGABYTE	GALAX	MSI
	GTX 970 AMP! Extreme	R9 380X	R9 380	R9 285 Black Edition	GTX 960 OC 4GB DDR5	GTX 960	GTX 960 OC 2GB DDR5	R7 370 Nitro	GTX 950 Gaming-2GD	GTX 950 EXOC White 2GB DDR5	GTX 950 Gaming 2G
	₹37,999	₹21,300	₹19,315	₹18,375	₹17,900	₹16,275	₹16,200	₹15,975	₹15,799	₹15,500	₹15,015
	56	45	42	30	37	37	38	28	33	34	33
	56	81	84	63	79	86	90	67	80	83	84
	23	15	15	15	15	15	90	90	60	45	34
	5	3	3	3	3	3	3		3	3	3
	GM204	Antigua XT	Antigua Pro	Tonga	GM206	GM206	GM206	Trinidad Pro	GM206	GM206	GM206
	1203	970	970	1050	1190	1266	1190	985	1140	1203	1127
	1800	1425	1425	1800	1753	1753	1753	1400	1653	1653	1663
	1664	2048	1792	1280	1024	1024	2048	1024	768	768	768
	104	128	112	80	64	64	128	64	48	48	64
	64	32	32	32	32	32	64	32	32	32	32
	4096	4096	2048	2048	4096	2048	2048	2048	2048	2048	2048
	N/Y/Y/ N/3xY/N	N/2xY/Y/ N/Y/N	N/2xY/Y/ N/Y/N	N/2xY/Y/ N/Y/N	N/Y/Y/ N/3xY/N	N/Y/Y/ N/3xY/N	N/Y/Y/ N/3xY/N	N/2xY/Y/ N/Y/N	N/Y/Y/ N/3xY/N	N/2xY/Y/ N/Y/N	N/Y/Y/ N/3xY/N
	8-PIN + 8-PIN	2x 6-PIN	2x 6-PIN	6PIN + 6PIN	6-PIN	6-PIN	6-PIN	6-PIN	6-PIN	6-PIN	6-PIN
	29	32	31	42	39	37	25	34	23	21	39
	59	81	79	77	65	75	68	76	61	47	61
	5.8	7.2	7.4	8.2	8.6	8.4	8.8	8.1	10.7	12.3	10.8
	84	97	98	99	90.3	98	93	89	102	96.4	101
	10212	8248	7724	5515	6788	6687	6965	5143	6022	6127	6024
	11638	9467	8703	5922	7688	7432	7888	5524	6654	6732	6670
	14105	12934	13012	14042	12949	14078	12957	12857	12996	12896	13700
	2534678	1335116	1385170	1278156	2500409	2542681	2542676	x	2545139	2521508	2545125
	2442809	1316339	1407323	1294654	2423409	2442877	2442877	x	2454288	2445900	2454278
	0	21928855	19919650	17825680	0	0	0	x	0	0	0
	19437680	18044770	17285150	16023846	15318548	15151885	15151885	x	12893198	12366945	12893121
	6.5	x	x	x	3.2	3.5	3.5	0	1.5	1.2	1.5
	9390	x	x	x	9321	9324	9324	8270	9312	9307	9310
	0	x	x	x	0	0	0	3310	0	0	0
	0	x	x	x	0	0	0	0	0	0	0
	94.7	54.1	48.4	42.9	60.2	60.2	60.2	36.3	49.7	49.7	49.7
	290.4	158.1	142.1	125.6	188	188	188	108.6	156.9	156.9	156.9
	397.5	230.4	193.4	176.5	273.4	273.4	273.4	153.9	237.9	237.9	237.9

could multi-task with ease, however, till now scheduling commands in sequence in the GPU pipeline was necessary. This also meant that certain commands had to wait in line till it could be processed. With Async Compute, these commands no

longer have to wait and unused resources could be dedicated towards getting more number crunching done. That's about everything new with the graphics world since our last comparison test. Let's move onto the winners.

Winners
Best Performer
NVIDIA GTX 1080 Founder's Edition
 This was no surprise since it's the only one in the flagship arena at the moment. AMD's VEGA is a long way from hitting the fac-

**GPUs BELOW ₹15,000**

	GALAX	ZOTAC	GALAX	ZOTAC	MSI	ZOTAC	GALAX
Model	GTX 950 OC 2GB DDR5	GTX 950	GTX 750 Ti OC Slim 2GB DDR5	GTX 750 Ti	R7 360 2GD5	GT 750 Zone Edi- tion 4GB	GT 730 2GB DDR5
Price	₹14,500	₹13,440	₹9,900	₹9,600	₹9267	₹9,083	₹5,850
Performance	89	90	65	59	58	51	23
Value for money	83	90	88	82	84	75	53
Build quality	30	90	45	45	45	75	90
Warranty (years)	3	3	3	3	3	3	3

FEATURES

Chipset	GM206	GM206	GM107	GM107	Tobago	GM107	GK208
Engine Clock	1114	1203	1072	1046	1050	1033	902
Memory Clock	1653	1755	1350	1350	1625	1250	1253
Stream processors/Shaders	768	768	640	640	768	512	384
Texture Units	48	48	40	40	48	32	32
ROPs	32	32	16	16	16	16	8
Memory (MB)	2048	2048	2048	2048	2048	1024	2048
Ports - VGA/DVI/HDMI/ Mini-HDMI/DP/Mini-DP	N/Y/Y/ N/3xY/N	N/Y/Y/ N/3xY/N	Y/Y/Y/ N/N/N	N/2xY/Y/ N/Y/N	N/Y/Y/ N/Y/N	N/Y/Y/ N/Y/N	Y/Y/Y/ N/N/N
External Power	6-PIN	6-PIN	N	6-PIN	6-PIN	N	N

Physical

Temperature (C)								
	Idle	24	22	27	32	33	32	24
	Load	61	62	52	60	78	65	44
Wattage (%)								
	Idle	10.5	10.9	3.1	4.3	8.6	5.2	11.8
	Load	103.1	102	104	103	95	101	99

Synthetic

3D Mark								
Fire Strike	Score	6017	6067	4360	3957	3904	3415	1542
	Graphics	6665	6715	4663	4129	4209	3520	1608
	Physics	12976	13022	12983	14050	12891	14070	13001
API Overhead								
DX11 Single Threaded		2545099	2545148	2495470	2495532	1401418	2153713	2539936
DX11 Multi Threaded		2454234	2454286	2447469	2447502	13521436	2112262	2443455
Mantle		0	0	0	0	13533617	0	0
DX 12		12892143	12893167	8534855	8534871	13521436	7365828	4109973

Steam VR

Average quality		1.5	1.5	0	0	0	0	0
Frames tested		9307	9312	7771	7770	7134	6706	2555
Frames below 90 FPS		0	0	6849	6847	6297	5909	2555
Frames CPU bound		0	0	0	0	0	0	0

Games

Tomb Raider	Ultra	49.7	49.7	29.4	29.4	28.7	26	x
	Medium	156.9	156.9	100.2	100.2	97.4	83.3	x
	Low	237.9	237.9	148.1	148.1	140.6	124.9	x

tory floor so for the near future, NVIDIA's GeForce GTX 1080 will rule the roost. Also, we haven't received any of the AIB cards yet so there are better overclocked cards that give more value for your money compared to the stock Founder's Edition card out there which we will be covering in due time.

Value for Money

We've broken down the cards into two categories, those that cost more than ₹15,000 and those that cost less than ₹15,000. In the former category, we have GALAX GTX 960 OC 2GB DDR5 priced at ₹16,200 providing the most value for your money. And

in the sub-₹15,000 category we have the ZOTAC GTX 950 OC Edition which offers the best value. This affirms what we've been thinking of ages, that sub-₹10,000 cards steadily offer lower returns. It's the same as the flagships, the more you pay, the less you get. If you look at the entire gamut of



Oldies Snapchattin

Research shows Snapchat is getting famous between the older demographics
<http://dgit.in/OldzSnapcht>



Minecraft update

Minecraft's 'Friendly Update' brings cross-platform multiplayer
<http://dgit.in/MCUpd>

GPU comparison

TAG	ZOTAC	GALAX	GALAX
GT 730 4GB DDR	GT 730	GT 730 EXOC 1GB DDR5	GT 730 2GB DDR3
₹5,850	₹5,145	₹4,900	₹4,900
11	11	24	11
25	28	66	30
38	38	75	23
3	3	3	3
GF108	GF108	GK208	GF108
700	700	954	700
667	667	1253	667
96	96	384	96
16	16	32	16
16	16	8	16
4096	1024	1024	2048
Y/Y/Y/ N/N/N	Y/Y/Y/ N/N/N	Y/Y/Y/ N/N/N	Y/Y/Y/ N/N/N
N	N	N	N
26	25	23	26
43	47	46	42
11.7	11.2	11.7	12.96
99	99	99	99
728	729	1612	731
751	740	1686	744
12994	12943	12996	12920
1682432	1682344	2535185	1682647
1367523	1368014	2445195	1367853
0	0	0	0
NA	0	4282813	NA
0	0	0	0
1374	1378	1950	1384
1374	1378	1950	1384
0	0	0	0
x	x	x	x
x	x	x	x
x	x	x	x



NVIDIA GeForce GTX 1080 Founder's Edition



GALAX GTX 960 OC



ZOTAC GeForce GTX 950 OC Edition



XFX R9 380X

GPUs, the mid-range is where you get the best value for money.

Editor's Pick

We like to game a lot and settling for a graphics card that just about gives 30 FPS in most games is just not our cup of tea. Nor

is paying through our nose for something ridiculously expensive to just wallow in the 60 FPS territory all the time.

We believe that the GTX 1070 would have easily won the Editor's pick and even the Value for Money award, alas, we didn't get the card for benchmarking yet. So we

went the best thing we have with us, the XFX R9 380X.

We had two cards around the ₹20,000 price point, the R9 380 and the R9 380X but the R9 380X gave better performance and has 4GB VRAM, making it the obvious choice for Editor's Pick. **d**

Bazaar

THE LATEST PRODUCTS
REVIEWED FOR YOU

The Digit Test Centre receives hundreds of products every month. Each of these products is put through a series of tests and is finally given a score. The final score is arrived at after considering a number of factors and evaluating them in terms of features, performance, value for money, build quality, and, in the case of software, even ease of use.

For better understanding of our ratings, here's a quick guide to our overall score

- 
Extremely poor product.
Keep away!
- 
Strictly OK.
Not recommended
- 
Decent product.
Go for it, but there may be better products out there.
- 
Very good product.
Highly recommended.
- 
Ground-breaking product.
We've never seen anything like it before.
A definite must buy!



Page 91 ▶
HTC 10



◀ Page 95
ASUS ROG
GL552VW



Page 97 ▶
OnePlus 3



Page 98 ▶
UE Boom 2



▶ Page 98
LeEco Le 2



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New Emoji update

The UTC has approved 72 new emojis including a selfie emoji along with a bunch of facial expressions. <http://dgit.in/Emoji90>



Google fiber buys WebPass

Google fiber is buying a high speed ethernet provider, WebPass to beef up it's business. <http://dgit.in/googlefiberx>

Bazaar

NVIDIA GeForce GTX 1080

Move aside Maxwell, Pascal is here to wreak havoc with the GeForce GTX 1080

NVIDIA has certainly hit it out of the park with the GeForce GTX 1080 and with VR in its crosshairs NVIDIA isn't leaving any stone unturned to capitalise on the new phenomenon. We've written quite a bit about the new cards and their pricing already. The GeForce GTX 1080, it's based off the GP104 GPU with a megatonne of CUDA cores and a lot more transistors than the GTX 980 thanks to the new 16nm FinFet manufacturing process it moved on to. The competition chose to go with an even smaller 14nm FinFET manufacturing process so the power-efficiency race is also heating up. Let's take a closer look at the architecture.

Pascal Architecture

The GP104 is based off the GP100 which is a datacentre-class Tesla GPU. With the increasing hype around the competition's offerings it was only natural for NVIDIA to step up its game. And that, they have rightfully done. Packing 2560 CUDA cores running at 1607 MHz, NVIDIA claims the GTX 1080 to be 1.5x more efficient in managing power compared to the GTX 980.

More Memory

The GeForce GTX 1080 now comes with 8 GB of GDDR5X memory. That's right, the GP104 doesn't come with HBM like everyone else predicted.

New features

Ansel

NVIDIA's new API is all about in-game photography. Once integrated into your video game it allows you to freely move the camera around so you can take better screenshots ingame.

NVIDIA VRWorks Audio

NVIDIA want's to give you full immersion through a new set of APIs that work seamlessly with the graphics card to apply path-tracing to audio.

Simultaneous Multi-projection

Aimed at the multi-monitor junkies, simultaneous multi-projection ensures that individual monitors from a multi-monitor setup retain perspective.

FastSync

FastSync decouples the render pipeline from display pipeline, so there is now a buffer between



the two pipelines. This solves the sync issues we were having.

Build and performance

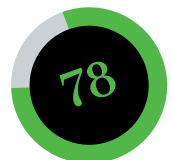
The Founder's Edition is a reference card which was till now not available in India but that changed with the GTX 1080. Reference cards are generally built with durable materials. The shroud itself is machined from magnesium-alloy and the cooling fan seems like a dual-ball bearing BLDC fan but we haven't ripped it apart to confirm. And NVIDIA has added a more geometric design with the GTX 1080. In our benchmarks, we saw it hit 80 degrees in 4K gaming which is a little too much. Gaming on 1080p isn't that taxing and we hardly saw temperatures go past 63 degrees celsius.

Needless to say this card pretty much aced every test. We ran the GTX 1080 with the new Hitman, Rise of the Tomb Raider, Witcher 3 and other games. We noticed an increment of 22-30 per cent FPS scores compared to the GTX 980 Ti. Even in synthetic benchmarks like 3DMark FireStrike Ultra, it managed to maintain a similar lead. We didn't have much time to overclock the card since we got out samples way late and we only had it for a really short time. So in a little quick session with the card we managed to eke out 231 extra MHz over the 1607 MHz stock frequency with a power target of 110%.

Pricing

The card is exorbitantly priced in India and it is quite unfair. For ₹63, 250 this card is way over-priced. With the GTX 1070 out, it hardly seems like the GTX 1080 justifies the price. Hopefully, the prices will come down soon.

Mithun Mohandas



Performance.....	90
Value	75
Build	70

Specifications

Chipset: GP104; **Base clock:** 1607MHz; **Memory clock:** 1733MHz; **Stream processors:** 2560; **Texture Units:** 160; **ROPs:** 64; **Manufacturing process:** 16nm, PCIe 3.0, 7680 x 4320 digital resolution support, 8 GB GDDR5X Memory; **DirectX support:** 12; **OpenGL support:** 4.5; **Power Connectors:** 8Pin; **TDP:** 180W; **Warranty:** 3 years

Contact

NVIDIA
Phone: +91 022 4376 4567
Email: NA
Website: www.nvidia.com



Secretive snapchat

To add to its computer vision technology, Snapchat has acquired Seene, a 3D selfies and a 3D photo app maker. <http://dgit.in/SecSC>



Google's Uninstall Manager

Running low on space? Google is testing a feature that tells you which apps you can remove based on how frequently you use them. <http://dgit.in/UninsMng>

Tt eSPORTS Level 10 M Advanced

Unique craftsmanship meets performance

The mean-looking Level 10 M gaming mouse from Thermaltake has been upgraded, or rather advanced, with ergonomic changes and RGB lighting. While maintaining an open design concept on the Level 10 M series, here you'll find a wing attached on the left side for your thumb with hardly any other major changes in the design. The mouse clearly isn't directed towards palm gripped gamers, whereas claw grip gamers will love how perfectly they'll be able to hold it. An additional advantage would be the adjustable palm surface that can be screwed in and out according to tilt preferences.

The mouse has six buttons including the regular right-click and left-click (Omron switches), the scroll wheel,



Price ₹8,499

forward and backward button and the DPI switch. The DPI switch is a 5-axis button (similar to an analog stick) so it can register up to five different clicks and its size has been shrunk from the previous version. It also lets you switch between the five profiles saved in the software. Using the software, a maximum of 12 functions can be assigned to all the buttons on the mouse. You'll also be able to define these functions to five profiles on to the mouse, scaling the possibilities further. One distinct upgrade to the mouse is RGB lighting to three different areas. The Avago 9800 laser sensor has a raw maximum DPI level of 8200 but with software, it has been scaled up to 16,000. The software lets you set different DPI levels to the four levels on the mouse and save them as profiles. This is taken care of by the 32-bit Sonix SN32F248FG microcontroller onboard.

The mouse isn't light and the presence of adjustable weights on the mouse would have been great.

Abhijit Dey



Features	76
Build	77
Value	70

Specifications

Dimensions: 130.75 x 87.35 x 40.53; **Sensor:** Laser (Avago 9800); **Maximum DPI level:** 16,000; **Switch:** Omron (50 million click cycle); **RGB lighting:** Yes

Contact

Thermaltake
Email: CS@thermaltake.com
Website: <http://www.ttesports.com/>

Circle Gaming CC 830

Average build quality, impressive performance



Circle has been a known brand locally to manufacture budget gaming peripherals and with the CC 830, they are trying to offer budget gamers with features found in high-end cabinets. Externally, the case looks great with a mesh front panel covering two 120mm LED fans. With the transparent side window panel (made of acrylic), you'll be able to brag about your components to your friends. On the inside, the motherboard plate has a different colour than the rest of the body which does look impressive.

An interesting feature that needs to be highlighted is the hot swap bay on the top panel.



Price ₹5,690

It lets you connect any hard disk drive or solid-state drive and use it as a portable storage device. Companies have started shipping cabinets with fan control, and you'll find it here for both the front and top panel fans. Removability of the top panel is easy but the front panel takes a little more effort. The installation of storage devices is child's play due to its tool less design.

The transparent side window panel is susceptible to scratches and you'll have to take good care while handling the case's plastic parts. In terms of cooling, it does a brilliant job by holding the 4960X at 61 degrees while the GPU runs hot at 62 degrees. The fans on the front panel keeps the temperatures of the SSD and HDD below 31 and 28 degrees respectively. Cable management is average, and we were able to manage a neat setup. Despite the price mentioned here, you'll find this at a cheaper rate online.

Abhijit Dey



Performance.....	76
Features	67
Build	65
Value	60

Specifications

Motherboard form factor: ATX and Micro-ATX; **PSU form factor:** ATX standard; **Front I/O:** 2 x USB 2.0, 1 x USB 3.0, Mic in and Audio Out, Fan control (top and front panel), hot swap bay; **Drive options:** 3 x 5.25-inch, 3 x 3.5-inch HDD, 3 x 2.5-inch SSD; **Fans:** 3 x 120mm (2 x front, 1 x rear)

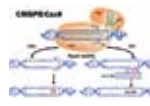
Contact

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Future Wearable Tech

So you thought smartwatches and fitness trackers could be all the wearable tech? Here's what can be expected. <http://dgit.in/FutureWT>



CRISPR

CRISPR is a gene-editing tool that may soon be used for medical treatment. <http://dgit.in/crisper>

Bazaar

HTC 10

The HTC we know

What started with the HTC One, culminates with the HTC 10. The company that made the first Android phone has nearly perfected its flagship this time.

The best quality of the HTC 10 is audio. This is a phone meant for audiophiles. It creates profiles based on your hearing patterns, and you can do this for each headphone you use. The settings for this show up only when you attach headphone, but it's easy enough to set a profile. The HTC 10 can amplify and improve audio quality on headphone, thanks to the 24bit DAC attached in it.

The phone delivers tight audio, that is clear and the right emphasis is placed on the important frequencies. We tested the HTC 10 with a pair of high end Sony MDR 100ABN, a cheaper Mee Audio M6, and a similarly priced Mi In-Ear Pro. The HTC 10 delivered louder and clearer audio on all of them, compared to an iPhone SE. While the iPhone SE is still close, comparing the HTC 10 to a OnePlus One shows huge differences. You should however, use high quality music tracks, 192kbps and above.

While audio quality is great on headphones, HTC Boomsound also comes with a tweeter and woofer this time, placed on the top and bottom respectively. However, the audio quality without headphones is nothing extraordinary. It is quite loud, but the HTC 10 seriously lacks bass in this setting.

HTC has also greatly improved the camera. The 12MP ultrapixel camera combined larger 1.55 micrometer pixels, with an f/1.8 aperture and OIS. Under daylight and well lit conditions, the HTC 10 is as good as the best smartphone camera today, but the true improvement has been made in low light. In fact, the phone sometimes takes better low light shots than the Galaxy S7 Edge, our top smartphone camera today. The HTC 10 drives up ISO, producing some grains in low light, but also provides better details.

While the camera is greatly improved, we'd still choose the S7 Edge over the HTC 10. This



Price ₹51,990

is because the phone's camera is still somewhat unreliable. It often refuses to focus, even in well lit conditions, and lights are often turned into flares. The camera often popped up a message saying that the laser auto-focus was being covered by something, at times because our finger was over it, but often when nothing covered it. The focusing issue is worse while shooting videos.

The Snapdragon 820 covers the performance bit for the HTC 10. However, unlike other phones powered by this processor, the HTC 10 tends to heat up quite easily. To be clear, these aren't heating issues, and we didn't see any processor throttling either. It's comparatively easy to get the HTC 10 to 40 degrees, but the processor seems to cool down fast enough and speed

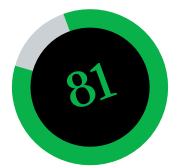
isn't affected.

The GPU performance is in line with other phones with QHD displays. Comparing a Samsung Galaxy S7 Edge, LG G5 and HTC 10, all of which have QHD displays, performance is pretty much the same. The HTC 10 renders nearly 600 frames on the GFXBench Car Chase Test, which is similar to its competitors. The 1080p OnePlus 3 can render over 1000 frames on the same test.

High performance, though, comes at the cost of battery life. The HTC 10's 3000mAh battery lasted for about 12 hours at best, on regular usage. This includes about three hours of browsing, two hours of continuous music streaming and seven phone calls, accompanied by lots of texts on WhatsApp. In general, you can get about 4.5 hours of continuous screen on time (at 50% brightness) with the HTC 10. It lasts for almost 7 hours on the Geekbench 3 battery test, with the screen dimmed.

Overall, the HTC 10 is a great smartphone and the best flagship from HTC in a long time. It can go toe to toe with any flagship today, but still has its downsides. It's definitely recommended for audiophiles, but while the HTC 10 is a great phone, it has its downsides and isn't perfect.

Prasid Banerjee



Features	66
Performance	81
Design	90
Value	77

Specifications

Display: 5.2 inch QHD;
SoC: 2.15GHz Qualcomm Snapdragon 820 quad-core;
RAM: 4GB; **Storage:** 32GB, expandable to 256GB;
Operating System: Android Marshmallow; **Camera:** 12MP Ultrapixel, 5MP front camera, both with OIS;
Battery: 3000 mAh

Contact

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Email: <http://www.htc.com/in/contact/chat/>
Website: <http://www.htc.com/in/support/>



Artificial SEO

The old rules of SEO may not be completely still applicable owing to rapid adoption in machine learning and algorithms on major platforms. <http://dgit.in/NewAISEO>



Smarter Alexa

In an announcement, Amazon's Alexa has grown to over 1,000 skills from the initial 135 skills it was released with. <http://dgit.in/Alexa1K>

Zebronic Unicorn ZEB-522B

Impressive cable management, misses out on efficient airflow

Although full tower cabinets offer numerous advantages, it demands a lot of space near your table. The Unicorn ZEB-522B is a compact form factor cabinet that's only 340mm in length and height, both. And this cabinet can fit a full ATX motherboard inside. This was made possible by separating the interior of the cabinet into two compartments – one housing the motherboard while the other side has the storage device slots and PSU cage. On the front, you'll be able to install two 120mm fans and on the top as well. There are also slots to add 80mm fans on each compartment but the case ships without any stock fans.

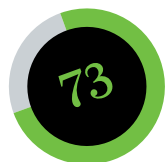
Price
₹3,400



The interiors have been well thought out with cable management in mind, and we hardly came across any setbacks where we had to reroute the cables. With enough cable tie slots and plate cutouts, we were able to achieve a neat look that didn't hinder with the airflow in the cabinet. For a streamlined airflow, the front panel was used for air intake and the top was used as an exhaust. Even though we didn't add the extra 80mm fans, we were able to maintain 64 degrees on the 4690X while the Radeon HD 7790 maxed out at 65 degrees.

The biggest concern with the case is the position of the storage drives since they kept struggling to stay cool. We observed a huge jump in the temperature (around 8 degrees) when the storage devices were subjected to stress. It's not much of a concern in real world scenarios but the design of the drive cages or their location could surely have been better.

Abhijit Dey



Performance.....	68
Features.....	70
Build.....	72
Value.....	82

Specifications

Motherboard form factor: ATX, Micro-ATX and Mini-ITX; **PSU form factor:** ATX (160mm) standard; **Front IO:** 2x USB 2.0, Mic in and audio out; **Drive options:** 1 x 5.25-inch ODD, HDD 3.5-inch x 2 / 2.5-inch SSD; **Fans:** 3 x 120mm, 2 x 80mm (not included)

Contact

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LINKSYS N600 Pro Wi-Fi Range Extender RE4100W

LINKSYS makes a comeback in style

LINKSYS has been on the down low in India for quite some time but it seems they're about to make a comeback. The N600 Pro was just launched in India though it had been announced way back in CES 2015. Powered by a MediaTek MT7628AN, the N600 Pro aims to occupy the mid-range segment and the feature set reflects the same. The unit has three circuit boards on the inside for power, mainboard and antennae. However, that's not the case because the MT7628AN is slightly more power-efficient. The RE4100W comes with

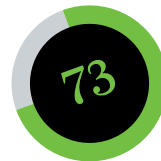
Price
₹TBA



the usual 100 Mbps Ethernet port, indicator LED and even a 3.5 mm stereo jack for streaming audio. Plug in an AUX cable and connect it to a speaker and you can wirelessly stream music.

To set it up, switch your mobile Wi-Fi to the Linksys SSID and head over to 192.168.1.1 for a quick setup guide. Performance-wise the N600 is quite decent. The signal strength held steady at around -35 dB in our Zone1 of testing while as we moved further away into Zone 2 is dropped to -52 dB and then in our farthest Zone3 it fell down to -74 dB. Even for bandwidth it maintained the link in Zone3 for longer periods compared to most Wi-Fi repeaters. Overall, the RE4100W is a well performing mid-range Wi-Fi range extender. What remains to be seen is if it will be priced competitively.

Mitbun Mobandas



Performance.....	73
Features.....	74
Build.....	72
Value.....	73

Specifications

Wi-Fi SoC 1: MediaTek MT7628AN; **Wi-Fi SoC 2:** Ralink RT5592N; **Channels:** 2T2R; **Ethernet:** 10/100 Mbps; **Wi-Fi Protocols:** a/b/g/n; **Bandwidth:** 600 Mbps; **Antennae:** 2x Internal; **WPS:** Yes; **Dual-band:** Yes; **Dimensions (LxWxD):** 100 x 69 x 73 mm; **Warranty:** 3 years

Contact

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S7 Edge Batman edition

Celebrating the 3rd anniversary of Injustice: Gods Among Us, Samsung has released a Galaxy S7 Edge Injustice Edition. <http://dgit.in/BtmnS7E>



RIP Thunderbolt monitor

Apple will discontinue making Thunderbolt displays, without announcing a replacement for it. <http://dgit.in/thunderboltx>

Bazaar

LeEco Le Max 2

Tres Bon

Chinese LeEco has managed to gain quite a following in India recently. But while the company's Le 1s smartphone was widely appreciated, the same can't be said about the Le Max. LeEco has learned from those mistakes, though, making a much better device this time.

Where the Le Max was a big tablet-like device, the Le Max 2 is more ergonomic, but still big. The bezel size has been reduced, and the display this time is a 5.7 inch unit, which reduces the overall footprint of the phone. It's much easier to carry around now and fits in your pocket better. Of course, it's still not meant for single handed usage, but it's a more ergonomically built phablet than its predecessor. It's a solidly built phone, which feels nice and there's no misalignment or other nicks in the design.

The Le Max 2 is also one of only two phones in India, that come with 6GB of RAM. We ran four heavy games, shot and edited a 4K video, ran an audio editor, and a photo editor, but were unable to exhaust the phone's memory. This is accompanied by the fast Snapdragon 820 SoC, which handles anything you throw at it.

However, the Le Max 2 tends to heat up quite easily. Like the HTC 10, this phone also reaches temperatures above 40 degrees quite easily, even in an air conditioned room. Shooting a 4K video for 10 minutes took the temperature up to 42 degrees, which isn't abnormal, but also didn't happen on phones like the LG G5 and OnePlus 3. To be clear, we didn't find any thermal throttling problems.

The CDLA feature on the LeEco Le Max 2 is interesting. While lossless audio is good on paper, LeEco's self manufactured CDLA headphones aren't very good. The audio is bright and warm, but there is no clarity across frequency ranges, and audio sounds muddled. CDLA technology itself has potential, but LeEco's implementation doesn't seem to be the best. Fortunately, you get a convertor in the box, which allows you to use your regular 3.5mm audio products with the phone.



Price ₹22,999

You won't get lossless audio with these, though.

Further, while the LeEco Le Max 2 has an improved camera, there's still work to be done. The 21MP camera takes good shot, with good dynamic range, and satisfactory colours. However, the camera tends to dull photos down a little bit. It's also refuses to focus at times, which is an issue. This becomes even more annoying when shooting videos. The phone sometimes refused to focus while shooting a video.

In terms of battery life, the LeEco Le Max 2 lasts for about 12-16 hours on heavy usage, including a lot of gaming. The QHD display, combined with the Snapdragon 820 reduces battery life, but for most users, it should last for a work day.

LeEco's content integration plays a big role in the value proposition of this device. You get a year-long subscription to Le Live and Le Vidi, the two apps responsible for delivering the content. This, in turn gives you access to YuppTV and Eros Now.

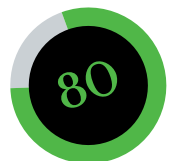
While the former brings live TV channels, the latter brings an impressive collection of movies. The apps have been deeply integrated into eUI, making them feel like a part of the OS, with no lags in loading or beginning a stream. You will need a high FUP connection to make good use of this phone, though.

The display lacks brightness, but is very good at colour reproduction, which is important for watching videos and movies. It's not ideal for outdoor viewing, but works fine indoors.

Overall, the LeEco Le Max 2 is an impressive smartphone, offering very good value at its selling price. It would have scored higher had the OnePlus 3 not come swooping in and raise the bar. It's well built and performs well, and the year long content subscription is a good deal, especially considering that the content offerings will keep growing in coming months.

It's not the best phone in this price range, but it's appreciable. It is not a bad buy.

Prasid Banerjee



Design	78
Performance.....	78
Features.....	71
Value	90

Specifications

Display: 5.7inch QHD;
SoC: 2.15GHz Qualcomm Snapdragon 820 quad-core;
RAM: 6GB; **Operating System:** Android Marshmallow; **Battery:** 3000 mAh; **Camera:** 21MP, 8MP

Contact

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Website: <http://www.lemall.com/in>



Bladeless fans!

Dyson's newest, the Pure Cool Link, has an air purifier, and is connected to your wifi, and has no blades. <http://dgit.in/bldlsfans>



God of War beyond Greece?

The new God of War 4, announced at E3, will be dabbling in Norse mythology. <http://dgit.in/GoW4x>

LG G5

Modular design FTW?

Creating the most innovative smartphone of the year is a risk, but LG took it upon itself to do so. The LG G5 is no doubt innovative, and opens up opportunities for the market to take a new turn. That said, LG's execution is less than ideal. We'll start with the modular bit.

A button on the left side of the G5 unlocks the bottom module of the G5, and this is where the magic happens. You can slide in other modules to enhance your smartphone. However, it's anything but intuitive. Getting used to the button takes time, which is by design. You don't want to press this button by mistake. That said, after you've pressed it, you have to pretty much yank the module out of the G5, which is dangerous when in a hurry. Your phone may, and in the long run, will, fly out of your hand.

The battery comes out with this bottom module and there's no reserve power in the G5 to keep it turned on. Imagine a situation where you need to click a quick photo and are switching to the Camera Plus module to it. You'll miss the moment because turning on the G5 will take a few seconds. It's not that the G5 takes a lot of time to boot, just that booting it again and again is annoying. Moreover, there's a locking mechanism inside, which raises the question as to whether it'll be damaged over the long term.

Lastly, the fact that the G5 has been launched with only two modules doesn't inspire confidence in the future. LG needs to sell large numbers of this device in order to get developers excited and create enough modules.

Modularity apart, the LG G5 is a pretty great phone. The Snapdragon 820 is fast, and 4GB of DDR4 RAM, combined with UFS 2.0 storage makes it even smoother. Apps load fast, but browsing performance is slightly lower than a Samsung Galaxy S7 Edge (Exynos model). For instance, Facebook's instant articles load after a split second stutter. We're nitpicking, sure, but it's also a flagship and at a 50K price point, most would nitpick.



The LG G5 also has a 16MP primary camera on the back, accompanied by an 8MP fish eye camera next to it. The 16MP camera on the G5 focuses on details, instead of brightness instead of details. Given the right light, your photos will be great, if a tad dim. Under low light, the G5 provides good photos, with accurate colours and good details.

The 8MP camera is a fish eye lens, and achieves 135 degree wide angle coverage. In doing so, it creates barrel distortion, which is a property of fish eye lenses. You have to understand the lens well enough to take good photos with it. Your subjects will also look distant, which is another property of fish eye lenses. The 8MP camera is also not well suited to low light photos, or videos.

Moving to the build and design, you come to another grey area. While the LG G5 is delightfully ergonomic, metallic phones usually feel more... metallic. This isn't the anodised

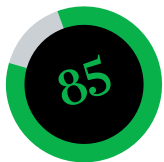
aluminium you get on an iPhone or other flagship devices. The looks unique, and is ergonomic, but it doesn't feel as premium as a flagship smartphone should.

Lastly, the display on the LG G5 is a big strength for the phone. It has a QHD display, with 544 ppi pixel density. It's easily amongst our favourite displays in the market today. It doesn't oversaturate colours like an AMOLED display, and gives you double the brightness that a mid-ranged phone would.

On the battery front, the LG G5 lasts for about 10 hours on heavy usage, which is pretty much the industry standard today. This includes 4 phone calls, 35 minutes of gaming, a few photos clicked, a short video and some more texts and emails. It's not the best battery life, and the Samsung Galaxy S7 Edge did last a bit longer, but only a bit.

To sum up, if you're buying a LG G5, you're buying a very good smartphone. Yes, the execution isn't done right, but there are good qualities as well. If LG does things right, you'll have more innovative modules to buy in the future, and this phone may impress you more than any other.

Prasid Banerjee



Features	76
Performance.....	83
Design	92
Value	81

Specifications

Display: 5.3 inch QHD;
SoC: 2.15 GHz Qualcomm Snapdragon 820; **RAM:** 4GB DDR4; **Operating System:** Android Marshmallow;
Battery: 2800 mAh;
Camera: 16MP + 8MP (Wide Angle) Rear, 8MP front camera

Contact

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Website: <http://www.lg.com/in/support>



Receive calls from a Pip-Boy!

This \$350 device pairs with your phone, and even doubles up as an alarm clock.
<http://dgit.in/falloutx>



Quake turns 20!

The FPS which paved the path for every other FPS turns 20, this month.
<http://dgit.in/Quakex1>

Bazaar



ASUS ROG GL552VW

Admirable gaming performance



Features 65
Performance..... 67
Value 71
Design 79

Specifications

Processor: Intel Core-i7 6700HQ; **GPU:** NVIDIA GeForce GTX 960M 4GB GDDR5; **RAM:** 16GB DDR4; **Internal Storage:** 128GB SSD + 1TB HDD; **Display:** 15.6-inch, 1920 x 1080p; **Keyboard:** Island type; **OS:** Windows 10; **I/O:** 2 x USB 3.0, 1 x USB 2.0, 1 x HDMI, 1 x RJ45 LAN, SD card reader, 1 x USB 3.0 Type-C

Contact

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The ASUS ROG GL552VW is more like repackaged and a little bulkier version of the ROG G501 we reviewed earlier. It features a similar specification sheet as the G501 with some minor changes. Design wise, this is a regular run of the mill gaming laptop. While there is not much to complain, we think the exhaust could have been placed at the rear. The 1080p display on the ROG GL552 is quite good. The laptop has a matte IPS panel, which offers great colour reproduction and one of the best viewing angles in the market. Overall, in terms of building quality, this ASUS ROG gaming laptop is certainly one of the better ones we've seen recently.

Talking about gaming, the NVIDIA GeForce GTX 960M and the Intel i7 6700HQ combo is cur-



Price
₹93,000

rently the best in the segment. We played the new Doom, Tom Clancy's Division, Dota 2, Battleborn and Call of Duty Modern Warfare on this laptop and all ran smoothly at 1080p, without any major hiccups. The only kink is, you end up playing most AAA titles at lower graphic settings.

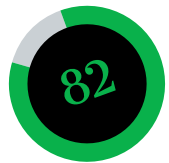
Casual gamers won't find the performance of the GL552VW lacking though. Games like DOTA 2 and CS:GO offered 60fps without any issues.

The bottomline as far as the ASUS ROG GL552VW's concerned is that it's one of the best laptops out there if you want to buy a gaming laptop around a ₹1 lakh budget. Although, if you are looking for something which is portable as well, the ROG G501VW may be the choice for you.

Hardik Singh

Sony MDR-100ABN

Excellent, elegant, expensive



The Sony MDR-100ABN, also known as hear ON Wireless NC headphones, are a pair of very well-crafted headphones. Sony has used the right fusion of plastic and metal to keep the headphones sturdy, durable, and yet, bear a smooth, matte finish that feels very premium. It has ample cushioning, although its weight does affect in an irritatingly way if you're wearing it for over 40 minutes.

In terms of audio quality, the MDR-100ABN are amply loud, with a pleasant brightness to the audio delivery. The excellent range of audio delivery here leads to great amounts of detail and very well-balanced audio. The low frequencies are tight and distinct, but does not overpower the mids. The highs and mids are bright, with particular emphasis to mids allowing the headphones to express bright,



Price
₹21,990

vibrant detail. The highs are prominent but not sharp, which preserves the overall sweetness and warmth of audio further.

Sony has added AI-powered Active Noise Cancellation here. The AI is aimed at learning your regular environments and their audio signals, to present highly effective noise cancellation. While the impact of AI is debatable, the noise cancellation works absolutely fine, ensuring no interference of ambient noise during your music playback times.

The MDR-100ABN lasts for about 19 hours on full charge, and takes 4 hours and 30 minutes to charge to full. It is an excellent pair of headphones, but at ₹21,990, is also rather expensive. If you can afford it by all means go for it.

Souvik Das

Features 91
Performance..... 90
Design 73
Value 63

Specifications

Driver Unit: 40mm Dome Type; **Impedance:** 32 ohms (power on), 16 ohms (power off); **Frequency Response:** 5 Hz - 40000 Hz; **Sensitivity:** Power off: 97dB/mW (wired), Power on: 103dB/mW (wired); **Weight:** 290g; **Features:** Hi Res Audio, Active Noise Cancellation, NFC.

Contact

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Email: NA
Website: <http://www.sony.co.in/electronics/headband-headphones/mdr-100abn>



Facebook censored!?

Facebook and Google use copyright scanners to suppress free speech!
<http://dgit.in/freespeechfb>



No surge pricing with Uber

After uberPOOL, uberX may soon shift to the upfront fares system where you won't have to calculate your fares anymore. <http://dgit.in/Uberupf>

Gigabyte GA-X99-SLI



An upgraded X99-UD4 for you SLI / CrossFire fanatics



Price ₹24,500 (+Tax)

Quad SLI is what the Gigabyte GA-X99-SLI aims to provide. Gigabyte might be feeling a little short-changed since NVIDIA decided to not offer 3-way and 4-way SLI on their GTX 1000-series graphics cards. However, you can still slap on four AMD graphics cards and ride the multi-GPU wave. Or you

can still put on four NVIDIA cards if you want to fiddle with HPC. There's no way you should look at a quad-SLI board as obsolete after the introduction of the GTX 1000-series. We noticed that this motherboard looks eerily similar to the Gigabyte X99-UD4 which we'd reviewed a few months earlier.

Aside from support for higher RAM clocks and a change in the order of the rear I/O USB ports thanks to an ITE chip there seems to be no difference between the two. However, if you peek at the section around the ITE8792E chip, you'll notice a lot of voltage regulators arranged in two neat rows, these seem to be used for powering the CPU socket. Well, not the whole of it but the extra power pins in the LGA 2011-3 socket that helps achieve higher over-clocks. Also, it does seem to have a better ring to it when you call it a X99-SLI instead of an X99-UD4.

Another difference we noticed was that signal traces and SMD components have now been moved slightly away from some of the motherboard mounting holes which is definitely a welcome change. At the end of it, the GA-X99-SLI has made a few changes to the GA-X99-UD4 to bring you an upgrade for a good price.

Mithun Mobandas



Features74
 Build75

Specifications

Chipset: Intel X99; **Memory support:** 8x3333(OC)MHz upto 128GB; **LAN:** Intel Gigabit Ethernet; **Audio:** ALC1150 7.1; **SATA:** 10x SATA III; **Expansion:** 4x PCIe X16(x16+x8+x16+x8); **Dimensions (LxWxD):** 305 mm x 244 mm; **Warranty:** 3 years

Contact

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Sony Xperia X

Typically Sony

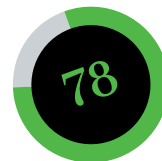


The Xperia X is what you would expect from Sony - well-built, compact, metal fused smoothly with good plastic showing why you do not always need metal on a smartphone. The 5-inch Full HD TRILUMINOS display, powered by Sony's X-Reality engine does very well with contrast and sharpness, and renders crisp, vibrant colours. Viewing angles are good, and touch response is fluid. Coupled with Android Marshmallow, Sony has added a few incremental improvements to enhance user experience, like smoother transitions and integrated Search.

Snapdragon 650, coupled with 3GB of RAM, ensures most operations remain smooth. Unfortunately, the



Price ₹46,960



Features75
 Performance.....78
 Design90
 Value65

Specifications

Processor: Qualcomm Snapdragon 650, **RAM:** 3GB, **Storage:** 64GB, **Display:** 5-inch 1080p, **Cameras:** 23MP rear, 13MP front, **OS:** Android Marshmallow, **Battery:** 2620mAh.

Contact

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Email: http://support.sonymobile.com/in/contactUs/mail/?region=en_IN
Website: <http://www.sonymobile.com/in/products/phones/xperia-x/>

pricing makes recommending the Xperia X more difficult. The Sony Xperia X feels slightly yet noticeably slower than Snapdragon 820-powered devices. It is priced at Rs. 46,900, about Rs. 34,000 more than Xiaomi's Redmi Note 3, which has the same combination of SoC and RAM as this. The highlight of this device, Predictive Hybrid Autofocus, is meant to ace smartphone photography. While it does well in amply lit conditions with colour, sharpness, detail and speed of focus, it isn't consistent in low light. The camera module is fast, only not the fastest in competition.

Heavy usage makes the Sony Xperia X last for about 11 hours, or more, which is decent. Summing up, while the Sony Xperia X is a good standalone smartphone, it does not justify the price it asks for.

Souvik Das



Siri with OS Sierra

Have been waiting to use Siri on your Mac? Not anymore. It sure looks like it, at least according to Siri. <http://dgit.in/OSXSiri>



Twitter v/s Snapchat

Snapchat Inc. has 150 million people using the service each day surpassing Twitter. <http://dgit.in/SnapVsTwt>

Bazaar

OnePlus 3

Gets it right

The third coming of the flagship killer is upon us, and the OnePlus 3 has a lot going for it. With the OnePlus 3, the company has managed to preserve the essence of a OnePlus smartphone, while taking a different approach on the design front. The biggest change, however, is the fact that OnePlus is doing away with the invite system. You can buy the OnePlus 3 directly via Amazon India, the exclusive online retailer for OnePlus 3 in India.

The OnePlus 3 has gone all metal, and it reeks of the quality and class that one expects from a flagship smartphone. At 158g, the OnePlus 3 is slimmer and lighter than ever before, with an Aluminium alloy-based unibody build that gently curves towards the edges for a comfortable grip. The design elements do remind us of HTC's previous generation flagship smartphones, but it doesn't take anything away from the fact that the OnePlus 3 is an extremely good-looking smartphone. Overall, the design of the OnePlus 3 is tasteful, classy and very premium. But, it isn't groundbreaking or unique, and it won't attract second looks or beg for your attention.

Coming to ergonomics and how the device feels on usage, we'd rate it high in terms of the 'in-hand' feel (yup, we just coined that term). For a device with a 5.5-inch screen and an all-metal body, the OnePlus 3 feels light and rather compact, and is definitely slimmer and easier to manage, when compared to previous OnePlus flagships. Having said that, the ultra-smooth metal back does make you wary of accidental drops, and the Sandstone finish on previous OnePlus flagships inspired more confidence in terms of grip. Coming to the display, the AMOLED display is bright, offers good contrast and great black levels. Unlike typical AMOLED displays, OnePlus 3 display doesn't suffer from too much of oversaturation, the color balance slider under settings provides the much needed control to fine tune the colors on the OnePlus 3.

On the performance front, the core processing engine of the OnePlus 3 is what Android enthusiasts dream of: Performance on tap, with copious



Price ₹27,999

amounts of RAM and a slick stock Android UI with no sign of bloatware. Running on a full-blown Snapdragon 820 SoC, the OnePlus 3 literally flies through any task you throw at it. Those six gigabytes of DDR4 RAM on the device ensures you never really worry about memory utilization. Having said that, 6GB of RAM at this point is an overkill; it is nice to have as a specification, but not something that you can put to use right away. OnePlus 3 sports a front mounted fingerprint sensor and as far as recognition and unlock speed is concerned, we can confirm that the OnePlus 3 is as fast as any other Android flagship out there. However, it doesn't quite match up to the 'Ninja' of the fingerprint sensor kingdom, the Nexus Imprint, which is still the fastest in our books.

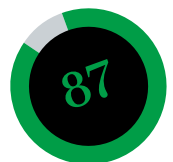
The 16MP rear camera on the OnePlus 3 will delight most flagship smartphone buyers who are looking for a respectable imaging performance. Photography enthusiasts and demanding power users will have to depend on the manual mode (which also supports RAW shooting), to extract more out of the Sony IMX298 sensor, especially in low-light.

The 3000mAh battery inside the OnePlus 3 is the least in terms of capacity of all the three OnePlus flagship devices till date. And, no amount of wizardry can possibly make the OnePlus 3 shine in the battery life department. On regular to moderate usage, the OnePlus 3 will last you a day. Heavy users will have to resort to a quick midday charge to keep things going. What really saves the day for the OnePlus 3 is its super fast, efficient charging powers. OnePlus 3 uses "Dash" charging technology that claims to fill up 60 percent of its 3000mAh battery in just 30 minutes. And, the claim is spot on (almost). We were able to go from 1 percent to 60 percent in 30.23 minutes

If you are in the market for a flagship smartphone, the OnePlus 3 is highly recommended, and in all likelihood, will tempt you the most.

Sobam Raininga

To read full review: <http://bit.ly/OnePlus3-review>



Features.....	73
Performance.....	84
Design.....	93
Value.....	90

Specifications

Display: 5.5-inch 1080p AMOLED display; **SoC:** 2.15GHz Qualcomm Snapdragon 820 quad-core; **RAM:** 6GB; **Storage:** 64GB, non-expandable; **Operating System:** Android Marshmallow; **Camera:** 16MP with PDAF + OIS, 8MP front camera; **Battery:** 3000 mAh

Contact

One Plus
Phone: 1800 102 8411
Website: <https://oneplus.net/in>



Android on iPhone

Nick Lee's case for iPhone does more than protecting it. IT CAN RUN ANDROID OS ON IT! <http://dgit.in/iAndrd>



Indegogo is the way to go

Got an amazing hardware concept in your head? Indegogo might be better than Kickstarter for this one. <http://dgit.in/HwIgogo>

UE Boom 2

One of the best around



Price ₹15,990

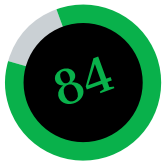
The UE Boom 2 is a prolific successor to the widely appreciated Boom wireless speaker. It looks almost identical, with the stitched thread facade and rubber flaps and strip dipped in playful colours. The rubber strip down the middle houses the volume buttons, and the USB and aux ports are housed in rubber flaps at the bottom rubber flap. It is 10g heavier than the original UE Boom, but that barely makes any difference

when it comes to using it day in, day out.

The beauty and warmth of the UE Boom 2's audio delivery hits you as soon as you start playing on it. The sound is rich, with great attention to detail. The presence of passive radiators enhances the bass delivery, which remains powerful, prominent, tight and very well balanced. Mids are amply pronounced, and the overall clarity adds to the experience. The highs are slightly sharp, but adds to the overall experience in a good way. Soundstaging is excellent, owing to the circular build of the UE Boom 2. The clarity, warmth and sweetness delivers a very comfortable experience, and in tracks that require power, the UE Boom 2 delivers aptly.

The UE Boom 2 lasts for over 20 hours, which is excellent for an outdoor wireless speaker. It plays audio via Bluetooth and 3.5mm analogue channel, and the presence of water resistance simply sweetens the deal. At ₹15,990, the UE Boom 2 is one of the best wireless speakers to invest in, both for home and outdoor listening.

Souvik Das



Features	87
Performance.....	86
Design	73
Value	83

Specifications

Drivers: 2x45mm active, 2x45mmx80mm passive radiators, **Max. Sound Level:** 90dB, **Frequency Response:** 90 Hz - 20000 Hz, **Waterproof rating:** IPX7, **Weight:** 548g.

Contact

Phone: NA
Email: <http://www.ultimateears.com/en-us/email-support>
Website: <http://www.ultimateears.com/en-us/ueboom2#intro-slide>

LeEco Le 2

The next prodigal son



Without a shred of doubt whatsoever, the LeEco Le 2 is the presently reigning king of the budget smartphone segment. Powered by Qualcomm's Snapdragon 652 SoC with 3GB of RAM, the LeEco Le 2 offers excellent performance, be it heavy gaming or regular operations like music streaming, browsing, chatting and the likes. It trumps the Xiaomi Redmi Note 3 in terms of overall fluidity of usage, albeit marginally.

All of this is contained in a reasonably ergonomic metal build, with a 5.5-inch Full HD display offering great contrast levels, good colour accuracy and an overall warmth that is great for consuming content. LeEco's eUI comes with integrated content services like Live and LeVidi, which offer on-demand movies and live



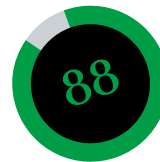
Price ₹11,999

TV services, free for one year. The Le 2's camera is better than the Redmi Note 3, only bettered by the Moto G4 Plus. Details are reasonably decent, and colours are vibrant and bright but slightly oversaturated. It suffers with noise and details in low light, but is decent for social media sharing.

LeEco's CDLA audio technology aims to provide lossless audio through the USB-C port, and the 3.5mm audio jack is missing. An adapter is packed in the box, and from what we could gather audio quality is pretty standard through it. You will last for about 11 hours at best with the Le 2, and the device charges quite fast when the occasion calls for it.

Overall, the LeEco Le 2 is the best smartphone to buy within ₹12k price point. Just don't think of anything else.

Souvik Das



Features	85
Performance.....	88
Design	85
Value	87

Specifications

Processor: Qualcomm Snapdragon 652, **RAM:** 3GB, **Storage:** 32GB, **Display:** 5.5-inch 1080p, **Cameras:** 16MP rear, 8MP front, **OS:** Android Marshmallow, **Battery:** 3000mAh.

Contact

Phone: 180030101838
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Website: <http://www.lemall.com/in/product/le2.html>



BitTorrent TV News?

BitTorrent may soon launch its own TV news network alongside its newly launched BitTorrent Live streaming platform. <http://dgit.in/BitNws>



The \$2 increment

What can \$2 increment in a service cost? Well, if its Netflix, it could cost the streaming giant 480,000 subscribers. <http://dgit.in/Ntfx2dlrs>

Bazaar

Yu Unicorn

Not the flagship you deserve



- Features 82
- Performance..... 61
- Design 69
- Value 58

Specifications

Processor: MediaTek Helio P10; **RAM:** 4GB; **Storage:** 32GB; **Display:** 5.5-inch 1080p; **Cameras:** 13MP rear, 5MP front; **OS:** Android Lollipop; **Battery:** 4000mAh

Contact

Phone: 18602122122
Email: support@yuplaygod.com
Website: <http://www.yuplaygod.com/product/unicorn>

The Yu Unicorn looks nearly identical to Meizu's m3 Note, the budget smartphone from the Chinese OEM. It does look nicely made, but the quality is nothing worth noting. Additionally, the dimensions of the phone hamper ergonomics. Delving deeper, the Helio P10 SoC's performance is barely acceptable, even in regular tasks as multi-tab browsing, chatting and streaming music, or light games as Skyward and Jetpack Joyride.

The Unicorn is the ideal example to show why 4GB of RAM is not solely enough to make a device perform well. Loading heavier games like Asphalt 8 make the device practically unusable, which is a major deterrent. The Unicorn is particularly difficult to justify, seeing the dif-



Price ₹12,999

ference in performance and almost every other aspect between itself and the likes of LeEco Le 2 and Xiaomi Redmi Note 3. The only point where it excels is in battery life, where even with heavy usage, the Unicorn lasts about 19-20 hours, or practically, about a day and half.

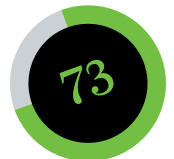
The camera lacks contrast and saturation, along with details. Colour data is reasonably decent, and the app is considerably responsive. The 5.5-inch Full HD display is amply bright, and watching movies is not too bad an experience. Yu's latest UI, Android on Steroids, has integrated services like cab and movies on offer.

To sum up, the Yu Unicorn is an overall disappointing effort and building a flagship device. It is not one to buy.

Souvik Das

Ricoh Theta S

A nice, fun beginning



The Ricoh Theta S is a very well-built camera, housing two wide-angle modules to capture the 360-degree content that it claims to do. It is highly convenient and easy to use, and the app it pairs with is also reasonably well laid out. The only qualm you would have is the rather small viewfinder on your smartphone, within the app. The camera syncs with your smartphone via Wi-Fi and controlling it through your smartphone is as easy as it gets.

The Theta S is one of the first 360-degree cameras around, and understandably there are flaws, as is the case with most first movers. While contrast levels are good in photos and videos, colours are somewhat oversaturated, and the camera renders high levels of noise in amber to low light situations. You can



Price ₹39,000

toggle with shutter speed, exposure, ISO and WB manually, but even the most optimal setting renders a lot of noise, unless you're in a very well-lit environment. It heats up a bit during operation, but is not a major deterrent. Additionally, the tripod mount will be helpful for adventure and action enthusiasts. The camera allows live streaming to Theta360.com, which you can embed to social channels.

Uploading and sharing is difficult and cumbersome. You can only upload 5MB videos via Theta360.com, or share your content to Facebook and then elsewhere, which is not an efficient method. Overall, the Theta S is your ideal buy if you're crazy about 360 videos. If you aren't too swayed by 360 degree content, stay put as better devices will surely follow.

Souvik Das

- Features 80
- Performance..... 68
- Design 82
- Value 55

Specifications

ISO sensitivity: 100-1600, **Shutter Speed:** Stills: 1/6400" - 60" (manual), 1/6400" - 1/8" (auto), **Videos:** 1/8000" - 1/30" (FHD), 1/8000" - 1/15" (HD), **Storage:** 8GB, approx. 1,500 photos/25min. videos, **Formats:** Stills: JPEG (Exif Ver. 2.3), DCF2.0 compliant, **Videos:** MP4 (Video: MPEG-4 AVC/H.264, Audio: AAC), **Weight:** 125g.

Contact

Phone: 18001030066
Email: ril.info@ricoh.co.in
Website: <https://theta360.com/en/about/theta/s.html>

Rise and revolt my brethren



Mithun Mohandas
Senior Reviewer
mithun@digit.in

"For a device that drives so much revenue we sure are very focussed towards ensuring that the industry has a hard time thriving in India."

When it comes to components, India has always had a poor track record of sticking to the International pricing. If something launches Internationally for \$699(₹47,500), you'd expect to get it at the same rate but what you end up paying is ₹63,250 (that's roughly 35% more). There's the ever-prevalent import tax which by nature is supposed to help protect the interests of Indian hardware manufacturers. Then there's the fact that these are considered a luxury item and hence, the tax makes for an additional stream of revenue for the exchequer. However, when it comes to silicon chips, there are no Indian companies whose interests need to be protected. Wikipedia has an elaborate list of silicon fabrication plants of which there's only one Indian fab, owned by ISRO. So obviously we should have import taxes to ensure big companies like Intel, AMD and NVIDIA should use ISRO's facilities for manufacturing chips, right?

Well, not quite. ISRO's fab only has 180nm lithography technology. And every computer hardware component under the sun has migrated to, or is in the process of migrating to 16nm / 14nm process. There's no reason why ISRO's facilities would be used by these companies because if they did, not only would the chip be the size of a 7-inch tablet but the cooling solution would end up being as big as full-tower cabinet. So in this impractical scenario, we still have import taxes against CPUs and GPUs. For what reason, I don't know.

What's worse is that our laws don't even have a category defined for GPUs, i.e. an 800 Million Dollar industry which in turn fuels the gaming industry, another goliath that accounts for 1.8 Trillion Dollars. Heck, we contribute to a significant portion of the R&D that these companies perform to generate these very CPUs and GPUs. Every graphics card imported into the country is filed under *Section XVI, Chapter 84, Entry 84733030 - "Other mounted printed circuit boards"*. How descriptive! For a device that drives so much revenue we sure are very focussed towards ensuring that the industry has a hard time thriving in India. Though there is no import duty, graphics cards still attract Landing Charges @1%, Countervailing Duty @12.5%, CESS @3% and CEX (Education & Higher Education CESS) @3%. All these account for a 15% increment in the product's value.


Wait... so... taxation results in a 15% increase in prices but at the end of the day we pay 35% extra?

Watson: Mr. Sberlock, something's amiss!

Sberlock: No shit, Watson. No...shit...

Businesses don't operate on simple arithmetic, so no, don't grab your pitchforks yet. It's obvious that a good chunk of this 20% is actually going to the sellers and logistics don't count for that big an increase. How do we know this? Why, we handle logistics for a magazine and we know how much it costs to get a magazine right into the hands of the reader i.e. you. However, here's the thing. Internationally, these cards are sold at their launch prices (say \$100) which includes all business expenses, production expenses, logistics costs, the seller's cut and generates revenue. In India, the brand keeps the \$100 and passes on every other overhead we just spoke of on to the consumer resulting in a massive price rise.

This in turn, leads to fewer sales in India which is, in my opinion, the most price conscious market in the world. And brands then claim that India isn't a key country for them owing to poor sales figures. Talk about shooting yourself in the foot. And we continue to suffer in silence. Well, not anymore. With the newest graphics cards hitting the Indian market, we noticed the same merciless pricing but something was different. Every ecommerce site has a tonne of negative reviews for these graphics cards because of this poor pricing strategy. And better yet, brands have even dropped prices ₹3-4K below the recommended MRP to gauge consumer reaction. So there are two ways in which this can go, brands might start selling at the proper 15% markup and reap the rewards of increased sales or they might not bother at all since sales aren't that high in India for this to make a difference anyway. I'm just happy to see my brethren voice their opinions against this unfair pricing tactic and invoke change.

One small step for the Indian PC lover, one giant leap for the #PCMasterRace. 

Let me know your thoughts on this column at: @mithun_mohandas

digit KILLER RIGS

Everything you'll ever need to build your own PC. Whatever your budget.

■ Basic rig = ₹29,851 ■ Entry-level gaming = ₹51,039 ■ Mid-range gaming = ₹75,372 ■ High-end gaming rig = ₹1,17,209 ■ Ultra high-end gaming = ₹2,65,427 ■ Digit test rig = ₹4,76,663

BASIC RIG

Processor	Intel Core i3 - 6100	8,650
Motherboard	ASRock H170A-X1/3.1	8,299
RAM	G-Skill Value F4-2133C15S-4GNT	1,237
HDD	Toshiba 1 TB DT01ACA100	3,440
Graphics Card	Intel HD Graphics 530	0
PSU	Corsair VS450	2,365
Speakers	None	0
Optical Drive	None	0
Mouse	Logitech MK120 Wireless (Bundle)	760
Keyboard	Logitech MK120 Wireless (Bundle)	0
Sound Card	None	0
Sub-total	(Excluding Monitor)	24,751
Monitor	Acer P168HQL	4,100
Cabinet	OEM Cabinet	1,000
Total		₹29,851

MID-RANGE GAMING

Processor	Intel Core i5 - 6402P + Cooler Master Hyper TX3	14,949
Motherboard	ASRock H170A-X1/3.1	8,299
RAM	Corsair Value Select (2x 4 GB)	2,915
HDD	Seagate Barracuda ST1000DM003 1 TB + Kingston SSD UV300 120 GB	6,307
Graphics Card	GALAX GeForce GTX 960 OC	17,500
PSU	Antec VP650P V2	4,340
Speakers	Sony SRS-D9 2.1	4,990
Optical Drive	LG GH24NSD1 SATA DVD Writer	949
Mouse	Logitech G100s (Bundle)	1,879
Keyboard	Logitech G100s (Bundle)	0
Sound Card	None	0
Sub-total	(Excluding Monitor and Cabinet)	62,128
Monitor	Viewsonic VX2263Smhl	9,738
Cabinet	Corsair Carbide SPEC 01	3,506
Total		₹75,372

ULTRA HIGH-END GAMING

CPU + Cooler	Intel Core i7-6700K + Antec Kuhler H20 650	30,699
Motherboard	Gigabyte GA-Z170X-Gaming 5	16,625
RAM	Corsair Vengeance (2x 8 GB) CMK8GX-4M1A2400C14R	5,200
HDD	WD WD30EZR 3TB + Samsung 850 Pro 256GB SSD	17,363
Monitor	Acer XB270HU 27-inch 144Hz 4K G-Sync	61,300
Graphics Card	ZOTAC GTX 1080 Founder's Edition	62,250
Cabinet	Corsair Obsidian 750D	11,460
PSU	Corsair RM1000i 1000W	13,298
Speakers	Logitech Z906 5.1	17,990
Optical Drive	LG Blu-ray WH14NS40 RW	5,999
Mouse	Logitech G502 Proteus Core	3,699
Keyboard	Steelseries APEX RAW	8,824
Sound Card	ASUS XONAR Essence STX	10,720
Total		₹2,65,427

ENTRY-LEVEL GAMING

Processor	AMD FX8320	11,800
Motherboard	Gigabyte GA-78LMT-USB3	4,899
RAM	ADATA AD3U1600C2G11-B 1600 MHz (2x 2 GB)	1,530
HDD	Seagate Barracuda ST1000DM003 1TB	3,769
Graphics Card	Sapphire R7 360 2GB	9,100
PSU	Corsair CX430 V2	3,031
Speakers	Philips MMS4040F - 2.1 Channel	3,033
Optical Drive	LG GH24NSD1 SATA DVD Writer	949
Mouse	Logitech MK200 (Bundle)	730
Keyboard	Logitech MK200 (Bundle)	0
Sound Card	None	0
Sub-total	(Excluding Monitor and Cabinet)	38,841
Monitor	BenQ RL2240HE	9,299
Cabinet	Antec X1-T Gaming	2,899
Total		₹51,039

HIGH-END GAMING RIG

Processor	Intel Core i5 6600K + Cooler Master Hyper TX3	18,749
Motherboard	MSI Z170A PC Mate	11,934
RAM	Kingston DDR4 2133 MHz HX-421C14FB/8 16 GB (2x 8 GB)	4,954
HDD	Western Digital WD20EZRZ 2 TB + Kingston UV300 SSD 240 GB	9,549
Graphics Card	ZOTAC GTX1070 Founder's Edition	38,937
PSU	Seasonic M12II-750 EVO	8,750
Speakers	Sony SRS-D9 2.1	4,990
Optical Drive	LG GH24NSD1 SATA DVD Writer	949
Mouse	CM Storm Devastator (Bundle)	2,499
Keyboard	CM Storm Devastator (Bundle)	0
Sound Card	None	0
Sub-total	(Excluding Monitor)	101,311
Monitor	BenQ GL2460HM	9,899
Cabinet	Corsair Carbide 400R	5,999
Total		₹1,17,209

PRIMARY DIGIT TEST RIG

Processor	Intel Core i7 - 6950X (Extreme Edition)	1,29,500
Motherboard	Gigabyte X-99 SLI	24,500
RAM	Apacer Panther 2666 MHz 32 GB (4x 8 GB)	15,840
HDD	Western Digital WD40EFRX	13,050
SSD	SanDisk Extreme II 240GB	34,000
PCIe SSD	Intel 750 NVMe + Kingston HyperX Predator 480 GB	1,19,275
Graphics Card	MSI GeForce GTX 1080 Gaming X	60,300
Cabinet+ Cooler	Cabinet (NA) + Noctua NH-D15	8,199
PSU	Corsair RM1000X	13,899
Monitor	LG 29UC97C	40,000+Tax
Optical Drive	NA	NA
Mouse	Mionix Castor	4,700
Keyboard	Corsair Gaming K70 RGB	13,400
Total		₹4,76,663



Twitter acquires Magic Pony

Twitter, just like its counterparts have acquired a machine-learning startup called Magic Pony – its third AI acquisition in three years. <http://dgit.in/TwtMP>

Apple in India, finally

Apple and other premium brands can now open flagship stores in India, owing to the changes in the FDI norms. <http://dgit.in/IndFDI>

SPEND SMART

This time around, we search for the best smartphones under ₹15,000, probably the most popular budget range. We also check out the best gaming mice out there, not holding back on any price bracket.



SMARTPHONES UNDER ₹15,000

Brand	Model	Processor	Clock Speed	RAM	Screen size	OS	Primary Camera	Battery Rating	Price (in ₹)
Xiaomi	Redmi Note 3	1.4 GHz		2 GB	5.5 inches	Android 5.1	16 megapixel	4050 mAh	11,999
Lenovo	Vibe S1	1.7 GHz		3 GB	5.0 inches	Android 5.0	13 megapixel	2420 mAh	12,999
Gionee	Marathon M5 Lite	1.3 GHz		3 GB	5.0 inches	Android 5.1	8 megapixel	4000 mAh	12,999
Motorola	Moto G 3	1.4 GHz		1 GB	5.0 inches	Android 5.1.1	13 megapixel	2470 mAh	12,499
Lenovo	Vibe K4 Note	1.3 GHz		3 GB	5.5 inches	Android 5.1	13 megapixel	3300 mAh	11,999
Asus	Zenfone Max	1.2 GHz		2 GB	5.5 inches	Android 5.0	13 megapixel	5000 mAh	9,999
LeEco	Le 1s	2.2 GHz		3 GB	5.5 inches	Android 5.0	13 megapixel	3000 mAh	10,999
Intex	Aqua GenX	1.3 GHz		2 GB	5.5 inches	Android 5.1	13 megapixel	2850 mAh	10,100
Acer	Liquid Z630s	1.3 GHz		3 GB	5.5 inches	Android 5.1	8 megapixel	4000 mAh	9,999
Micromax	Canvas 5	1.3 GHz		3 GB	5.2 inches	Android 5.1	13 megapixel	2900 mAh	8,785
Lenovo	Zuk Z1	2.5 GHz		3 GB	5.5 inches	Android 5.1	13 megapixel	4100 mAh	13,499
Huawei	Honor 5X	1.5 GHz		2 GB	5.5 inches	Android 5.1	13 megapixel	3000 mAh	12,999
OnePlus	X	2.3 GHz		3 GB	5.0 inches	Android 5.1	13 megapixel	2525 mAh	14,999
Meizu	M1 Note	1.7 GHz		2 GB	5.5 inches	Android 4.4	13 megapixel	3140 mAh	14,499
Infocus	M530	1.7 GHz		2 GB	5.5 inches	Android 4.4	13 megapixel	3100 mAh	10,999



GAMING MICE

Brand	Model	Type	Max. DPI	Buttons	Sensor Type	Adjustable Weights	Grip	Price (in ₹)
Dragonwar	Leviathan	Wired	3200	8	Laser	No	Palm/Claw	1,025
Logitech	G402 Hyperion Fury	Wired	4000	8	Laser	No	Palm/Claw	2,795
Razer	Naga	Wired	5600	17	Laser	Yes	Palm	6,400
Mionix	Castor	Wired	10000	5	Laser	No	Palm/Claw/Fingertip	9,166
Razer	Deathadder Chroma	Wired	10000	5	Laser	No	Palm/Claw	4,499
Logitech	G900	Wired/Wireless	12000	11	Laser	No	Palm/Claw/Fingertip	19,872
Roccat	Kone Pure Military	Wired	5000	7	Laser	No	Palm/Claw	4,900
Corsair	Sabre	Wired	6400	8	Laser	No	Palm/Claw	4,699
Roccat	Nyth	Wired	12000	18	Laser	No	Palm	8,900
Steelseries	Sensei	Wired	5700	8	Laser	No	Palm/Claw	6,398
Cougar	550M	Wired	6400	6	Laser	No	Palm/Claw	9,000
Razer	Ouroboros Elite	Wired/Wireless	8200	11	Laser	Yes	Claw/Fingertip	10,360
Razer	Mamba	Wired/Wireless	16000	9	Laser	No	Palm/Claw	10,480
Corsair	Vengeance M65	Wired	8200	8	Laser	Yes	Palm/Claw	4,055
Logitech	G302 Daedalus Prime	Wired	4000	6	Laser	No	Palm	1,670

digit RECOMMENDED BUYS

From smartphones to graphics cards, here's what we recommend for your next purchase!



TOP 3 SMARTPHONES

Brand	Model	Price (in ₹)
Samsung	Galaxy S7 Edge (32GB)	56,900
LG	G5 (32GB)	52,990
Apple	iPhone 6s (16GB)	47,999



TOP 3 LAPTOPS

Brand	Model	Price (in ₹)
Dell	XPS 13	1,34,590
HP	Spectre 13	1,19,900
Dell	Inspiron 15 7559	1,18,888



TOP 3 GRAPHIC CARDS

Brand	Model	Price (in ₹)
NVIDIA	950	13,800
AMD	R7360	10,500
NVIDIA	750Ti	11,000



TOP 3 GAMING KEYBOARDS

Brand	Model	Price (in ₹)
Corsair	STRAFE RGB	16,000
Corsair	K70 RGB	14,000
Roccat	Isku FX	7,200



TOP 3 MIRRORLESS CAMERA

Brand	Model	Price (in ₹)
Sony	A7R	1,04,380
Olympus	OM-D E-M1	98,400
Fujifilm	X-Pro 1	55,000



TOP 3 PREMIUM POINT AND SHOOT CAMERAS

Brand	Model	Price (in ₹)
Sony	DSC RX 100 III	52,990
Canon	PowerShot G1x	45,215
Nikon	Coolpix P7700	23,204



TOP 3 TABLET

Brand	Model	Price (in ₹)
Apple	iPad Pro 12.9 (128GB, Wi-Fi + Cellular)	91,000
Apple	iPad Air 2 (64GB, Wi-Fi + Cellular)	45,800
HTC	Nexus 9	39,990



TOP 3 BUDGET BLUETOOTH SPEAKERS

Brand	Model	Price (in ₹)
JBL	Go	1,890
Logitech	X100	1,550
Portronics	Sublime 2	2,068



TOP 3 CPU LIQUID COOLERS

Brand	Model	Price (in ₹)
NZXT	Kraken X61	9,799
Thermaltake	Water 3.0 Ultimate	15,000
Corsair	H110i GT	15,300



TOP 3 FITNESS TRACKERS

Brand	Model	Price (in ₹)
Fitbit	Charge HR	14,999
Fitbit	Alta	12,999
Jawbone	UP3	11,999



Battlefield 1 gameplay

Battlefield 1 will be releasing in October, but here's how the newer weather and the explosions in the game look. <http://dgit.in/Btflfd1GP>



New Netflix icon

No, Netflix is not introducing a new logo. But hey, here's their new icon. <http://dgit.in/NFXicon>

Action Cams



Magical discoveries from the land of GoPros

Agent 001
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When have you ever used your DSLR or camcorder to shoot more than a few minutes of video clips in a controlled indoor or outdoor environment? Chances are not too many times. As great as its video quality may be, try holding an iPhone while you're standing at the door of a Mumbai local (actually, don't try that, you'd be risking your life) just to capture what it feels like to be in the moment? If you want to record videos of your trekking adventures, would you hold a DSLR in your hand while you're roughing it out in the woods? Or if you're going to go rafting or scuba diving, would you carry a companion along just to hold the camcorder and shoot your videos for you? If the answer to all these rhetorical questions is no, then my friend you need to go buy an action camera.


An action camera negates all the inconveniences of a traditional camera. It's lightweight, easy to attach through a wide variety of mounting stands (on your helmet, on your bike's handle, etc), can capture 60fps 1080p video (some can also shoot 4K UHD videos, if you're inter-

ested), and easy to operate. What's more, a wide variety of the most popular action cameras are waterproof, and almost all of them come with watertight cases that can be used in deep-sea diving scenarios. Action cameras don't have a lot of physical controls on them – no interchangeable lenses, too – and that's part of the point. With a fixed lens and aperture, action cams are meant for capturing a wide angle shot in almost all video scenarios, and almost all of them have supported companion apps on smartphones in case you need advanced functionalities for any occasion. Despite being tiny and small, action cams are built tough and meant to be used in an outdoor environment, and therefore come with as little moving parts as can be managed.

Having read about all the glittering positives of an action cam, time for some cold hard reality. It's important to remember that action cams can't replace your existing DSLR or camcorder; they're meant to be used in scenarios where DSLRs or camcorders fail or become unwieldy. Therefore, despite being capable of crisp, high-quality 1080p videos, action cams operate within tight optical constraints. For example, because capturing the maximum field of view is

the most go-to priority of an action cam, captured videos (or images) often suffer from a fisheye effect, which has become sort of a signature trait of footage captured from an action cam. The industry and action cam enthusiasts have gotten used to looking past this optical aberration, but it may not go down too well among photo and video connoisseurs.

Battery drain on action cams is also something you need to know about. While, yes, most popular action cams easily offer between 1 to 3 hours of video capture time (depending on the quality of the video being captured, of course), weather can impact battery drain more acutely than you'd think. For instance, in really cold environments (close to 0 degree C), GoPro cameras have been known to not work for more than a few minutes due to its battery juices starting to freeze over. Even extreme heat – like what some parts of Western India experienced this summer with temps over 50 degree C) – can throw sensitive action cam batteries into a tizzy. I don't know why this behaviour is so unique to action cams alone, or whether it stems from an observation bias restricted to the category of these devices, but I'll let you guys know more as soon as I have more data to share. While battery replacements are available aplenty, popping them in (or out) isn't as easy on action cams in comparison to most DSLRs or camcorders.

As far as which action cams to invest in, GoPro cameras pretty much rule the market. Checkout their Hero series of action cams, offering versatility and functionality in a small, light form factor. I've had a lot of fun playing around with one over the last couple of months, personally. Also checkout the Polaroid Cube, the tiny camera we mounted on the IO Walk hoverboard we tested a few months ago. Its recorded footage seemed really cool through that perspective but doesn't hold up in comparison to the far superior GoPro quality. 



Domestic Robots

After cars and rockets, Elon Musk's next target is home centred domestic robots for home use, owing to OpenAI. <http://dgit.in/HomeRobo>



Trainer on fingers

BioRing is a crowdfunding campaign that may give Smartwatches and fitness bands a run for their money. <http://dgit.in/FitRing>

Agent 001

Budget PC cabinet

Hello Agent 001,

I had upgraded my PC last year but had bought myself a cheap cabinet which cost me around 1k so you can imagine how bad the quality would be. I have been searching for good cabinets but couldn't make up my mind. Please suggest me a good budget gaming cabinet where I can get good quality and have it last for a long time.

–Shardul Sharma



A Hey Shardul, nice to learn that you upgraded your PC. Along with the basic components, your cabinet is something you should invest properly since it matters in the long run. It would have been great if you had mentioned your budget range but if you're looking for something around 3k, the Corsair Carbide 100R will serve all your basic needs including radiator support (if you plan on adding one). But again, it's a plain looking case with no fancy design. If it's a concern, then by adding a little more money, you'll be able to pick up the Antec GX500. It not only offers good cable management but looks great to show off to your friends. If available in stock, you should be able to get it under 4k.

Need a gaming mouse

Hi Agent001! My MK200 bundled mouse just broke down. After having used high quality gaming mice like the Steelseries Sensei RAW, I've understood the difference and I'm looking forward to buy a good mouse. Budget isn't an issue, but it would be great if you could recommend something below 5k since I can convince

my parents for that budget. I don't need RGB lighting or extra buttons but if there's anything falling under my budget please let me know. Thanks.

–Tarun Goel

A Hi Tarun, we're happy that you've personally tried out a good quality gaming mouse and understood the better experience. We always try to educate our readers on how effective your gaming experience can be if you make calculated investments on peripherals. A budget of 5k is quite flexible to buy yourself a really good gaming mouse, and our recommendation would be the Logitech G502 Proteus Core. You'll be able to get it for around 4k and trust us, it has a wonderful ergonomic design for right-handed gamers. You would be delighted to know that the Mionix Castor is another beautifully designed gaming mouse selling for a little more which has RGB lighting. Both the mice mentioned above offer great palm grip and brilliant build quality. The advantage of the G502 is more buttons and adjustable weights.



Affordable and portable Bluetooth speaker

Hey Digit, I'm confused between JBL Go vs F&D Swan 2 portable speakers. Which one should I go for? Or any other Bluetooth portable speaker in the same budget of around 2000?

–Aviral Singhal

A Hi Aviral, the JBL Go is pretty good. For its size, it's loud and powerful. We've not had a chance to review the F&D Swan 2 yet but the old Swan 1 was quite bad. This is not to say that all F&D products are bad, but with the Swan they definitely went for form over function. Hopefully they've made improvements with version 2. We can tell you for sure after we call it

in for review. Another good alternative is Logitech X100. Hope this helps.



Phone under 15k

Greetings Digit. I'm looking forward to buy either the Samsung Galaxy J7 or the Moto G Plus (32GB + 3GB RAM versions). Which one should I go for? Any other better one in that 15k price range? I am mainly looking for a phone for business purposes in terms of processing speed and multitasking. Camera is of secondary importance. My previous phone micromax android one had to be thrown since it went dead after a year...that's something I want to avoid.

–Sanket Nikte



A The Moto G4 Plus is definitely a much better buy than the Galaxy J7. That said, here are my recommendations.

- 1) If power is of paramount importance go for the LeEco Le 2.
- 2) If it's the camera, then Moto G4 Plus.
- 3) If it's the battery life, get the Xiaomi Redmi Note 3.

The Galaxy J7 is pretty much Samsung asking for brand tax for a phone that belongs in 2015. The Redmi Note 3 would be the best choice though. Good battery life, respectable speed. The LeEco Le 2 is faster, but compromises battery life by a bit. Fair warning though, it feels metallic, but isn't a truly uni-body metal build. The only phone in this range that's a solid piece of metal, is the Le 2.

YOUR APPS INSIDE A MEIZU SMARTPHONE!

Digit organised a student developer event in Delhi on Saturday, April 16th, which was powered by Meizu to promote developer initiative and create great apps that can be used in the Meizu ecosystem to better augment the Flyme OS.

The Top 15 developers from all over Delhi NCR were selected and invited to be a part of the event which was held in Sri Aurobindo Centre for Arts & Communication in New Delhi. The event started with a video of Meizu's dynamic and unique manufacturing process, and how every detail on the phones are crafted by state of the art machines.

THE TOP 15 DEVELOPERS FROM ALL OVER DELHI NCR PARTICIPATED IN THE MEIZU EVENT

Mr. Leon Zhang, the Marketing and Product Head of Meizu India then gave the keynote speech in which he briefed the audience with the history and latest developments at Meizu. This was then followed by all the developers presenting their Apps detailing all the features and USP's and answering the jury's and fellow developers' questions. Lunch followed right after, which was followed by a group interaction session with the Meizu team. The event ended with a prize distribution ceremony to laud the efforts of all the developers and Meizu presented all the developers with a Meizu m2 smartphone.



About 15 participants were selected to present their App demos



The audience listening to a participant



The Jury sharing their insights and feedback with the participants



Participants with the Meizu team

OUR TOP 5 APP PICKS



One of the participants giving a Demo of their App via voice recognition



One of the participant explaining their app during their presentation



Participants being presented with the Meizu m2 smartphones and Round 2 certificates



Participants being presented with the Meizu m2 smartphones and Round 2 certificates

CODE WITHOUT A LAPTOP

I am thinking of developing an app with which users can code anywhere on their mobile device. Apart from this, the app is going to have some challenges and coding problems, user will have fun to solve those. The supportive languages would be JAVA, C, C#, Python and maybe some more! This solves the issues of students or young professionals who don't have a laptop to code, but still want to. I have done some research and will be able to build the product as I've started working on features like Syntax highlight, suggestion bar and other complex time consuming tasks for the app.

—ANKUSH CHUGH

HELPING HANDS

Across the world, there are people in excess who throw their stuff because of the new trend and obsolescence of the old goods. But they have no idea that there are abundance of people who have never even heard of that goods. People also don't know that where to donate that unused goods. For this problem an app can be developed which will connect orphanages/ shelter homes/ organisations etc. directly with the donors. People can provide clothes, toys, gadgets, money etc. according to the need with the help of app. Food scarcity is also a major problem so restaurants/food chains/Parties unused food can also be delivered to the slum, orphanages so that the needy can have better meal and we can be a helping hand for others.

—AKANSHA MARWAH

BUSINESS CARD SHARING APP

In business meetings and startup weekend meetups, we have to carry our business cards to network effectively. Carrying cards is a pain, but with this app we can share our business cards virtually by entering essential information like email address and phone number without a hitch.

—DIPESH NAGPAL

ANONYMOUS

An app which lets you make an anonymous announcement hyperlocally.

—ASHUTOSH GOEL

ACCIDENT ALERT

My app will send an emergency beacon signal to prefixed numbers on your phone (friends and family, and police and hospital services) based on your location, average speed using GPS history, and accelerometer and gyroscope sensors.

—VISHAL JANGID

Industry Connect

We have interesting discussions with executives from NVIDIA, Intel and Akamai. Read on.

**PC or webcam?**

This webcam is actually a PC, but you can still record things with it. <http://digit.in/webcamx12>

Going mobile with Impress.ly

It is now super easy to make a website on any platform. Here's how...

Ankush Maiti
feedback@digit.in

If you've ever visited the website of a less known organisation, you might have been pleasantly surprised, or very, very frustrated. (Not including government sites. They have a penchant for being very frustrating, and that is only if they manage to work.) Most of this can



Create beautiful websites in minutes

be blamed on low-budget web design, and in the case of government sites, non functioning servers.

Impress.ly is a website builder which focuses on creating app-like websites across platforms like desktop, tablets, and mobiles. The best thing about this builder is that it can be also be run on any platform. It is now possible to build a website on your mobile phone, in a matter of few minutes. No more extensive coding or paying web developers to make your sites.

How to:

All you have to do is get onto the website, and start creating your own website. The

moment you start creating your website, the builder asks you to provide your business' facebook link. It then mines the internet for any other social media your business is active on, and pulls it all onto one page. You can then select which ones you want to have on your website.

After that's done, you have to select one out of the ten templates (or skins) provided by the builder, and the builder does the rest. Seamlessly melding all of your business' social media into whichever template you've chosen.

You can then edit it however you like. Add or remove pages, create different pages, and links, and even add a blog onto it. It's easy to do, but it is limited in what you can actually do. There are many customising options, but if it's not something that

the builder says it can do, you probably won't be able to do it.

Adding an online shopping cart to your website is equally easy. You just click on that option, and it provides you different themes and ways you can create one, by showing you sample products. It feels smooth, and you can provide all the products your business has for sale at whatever time you see fit.

On the phone, making a website is equally easy. Simply download the app, and

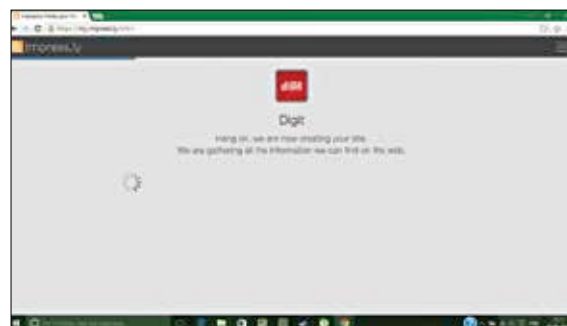
use it as you would use the desktop version of the builder.

What's good:

Impress.ly is stupidly easy to use. You literally just have to enter your business' Facebook link into the editor, and the builder "automagically" pulls all the social media related details to your business, and creates an app-like mobile website, with ten different templates (or skins) to choose.

It also provides a lot of customisation options, and even lets business owners add an e-commerce aspect to their website. The builder has different templates which are suitable for different businesses, which makes it easier to create websites for specific businesses. The builder, as of now, is mostly aimed at restaurant owners, who want to have an app-like website.

Impress.ly is a quick and easy way to create a fully-functioning website, from any platform. Small business owners don't have to pay a lot of money to website developers to create a site now. They can



It adds details by pulling data from your Facebook page



Good guy Oculus!
Oculus Rift lets Vive users play Rift exclusive games.
<http://dgit.in/vivexrift>



Incipio buys Skullcandy
Incipio buys Skullcandy to expand its accessory line.
<http://dgit.in/skullcandyx>

easily buy a subscription to Impress.ly and they're good to go, with a professional looking website, suited to their needs.



You don't need any coding expertise to create a website

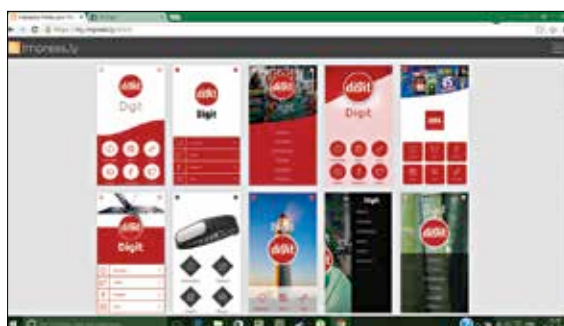
It is an amazing tool, for non-coders, because it picks up whatever you've put on your business Facebook page, and puts it on the mobile site. One wouldn't have to spend hours of coding, making sure every single line of code is perfect. Want to add a page to your site? Just drag it onto your preview, and your website now has a new page.

What's not-so-good:

One of the major drawbacks of Impress.ly is that the templates offered are simply not enough. Even if you were to create a completely custom website, from any of the provided templates, you wouldn't be able to visit a site created on the same template without a creeping sense of déjà vu.

Some of the categorisation doesn't make sense. For instance, a "blog" is listed under a business, and Google+, according to the builder is more suited under the "basis" tab, rather than the "Social" tab.

It's very easy to do, yes. But, there is a limit to what you can do with it. If it's not something that impress.ly has in its menus, you simply cannot do it.



By default, it gives you several templates to try

The site is slightly buggy, and it still has some support issues. The developers claim that it is "capable to run on any modern browser". The mobile version of the builder comes in the form of an app, and is compatible with iOS and Android devices. Although, even those aren't that good. It crashes frequently, and is quite buggy.

Pricing:

Hiring a professional web design company to create your website can burn quite a hole in your pocket. There

are designers who offer to provide SEO and hosting for a year for a cumulative package which costs around ₹10,000. Impress.ly costs around \$9, a month, which roughly translates to around ₹600 a month, which is around ₹7,200 a year, for the Impress.ly starter pack. This includes hosting, some branding by impress.ly, basic analytics, and social feed.

Impress.ly also has a business package, which costs around \$14, monthly. This pack provides everything that the starter pack does, without the branding, and also lets you add an e-commerce aspect to your site. It even lets you have a blog, and lets patrons make reservations online, if the business needs it. Although, closer to around ₹1,000 a month, web designers charge around double that amount, for a site which also has an e-commerce aspect.

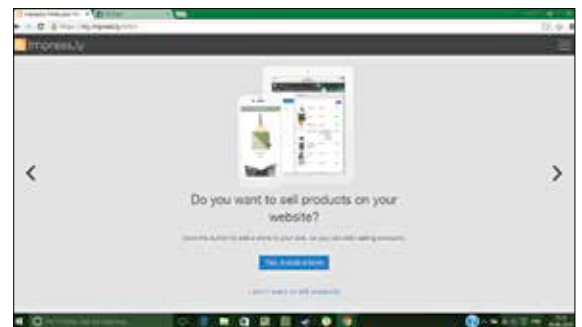
Impress.ly also has a free version, which lets you play around with the builder and create your website. It won't let you publish it without any payment, but they realise that patrons don't exactly like being told to buy features every few minutes. It gently prompts you, every once in a while, to publish your website, but doesn't block you from adding any features.

Although, if your subscription ends, your site will

be pulled down. It's kind of a bummer, but that's how it is. Although, hiring a web developer is cheaper, in the long run, because you'll only be paying a few hundred bucks for hosting, after the initial year. Over a period of five years, a web developer will cost you roughly around ₹1,200 a year, after the first year, whereas impress.ly will still continue to cost you the same amount, every year. That would bring the total to about ₹14,800, for a web developer, and around ₹36,000 for impress.ly, over five years. Not so cost efficient now, eh?

Conclusion:

Impress.ly is a nifty little tool for entrepreneurs on the go. You can have a mobile website up and running in a few minutes, and it's cheaper than many web designers. It helps you create HTML5



Adding an e-commerce module to your website is easy

apps for your websites on Google Play-store and Apple App Store, as well.

The websites look clean, and are easy to create. The internal builder does a good job of making website building as simplistic as possible.

The builder is created with a lot of different businesses in mind. Food businesses, and music businesses included. It has a lot of templates which are created with these niche businesses in mind. The e-commerce add-on is truly a remarkable feature, at the price it's offered at, and it makes it that much more appealing to entrepreneurs on a budget.

Although, it's still in its early days, and there are still many bugs and rough edges that need to be ironed out, it's still quite a good tool. It offers what it says it can offer, and delivers a satisfactory product, most of the time. **f**



Valve on VR

About 1/3 of gaming mammoth Valve is devoted to VR and the future of their HTC Vive VR system <http://dgit.in/valvevr>



Apple returns money

Consumers are finally getting their money back after Apple was found liable for overpricing books <http://dgit.in/iReturn>

Siddharth

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1 When it comes to the Internet of Things (IoT) the theoretical aspects itself are very exciting to us and our readers. What you're into – implementation at that macro level such as smart cities – is an equally exciting but entirely different ballgame. Can you give us an overview of say what the architecture of such an implementation is likely to be, or what the roadmap is?

Kavitha: When we talk about Smart Cities, it's a bunch of IoT solutions that are coming together, because for something to be smart, it just needs a context. To define context let's think of a bus going in a certain direction. If the bus also has an idea of how many passengers it will likely pick up on the road and how well utilized it will be at the end of the day, it gives a better sense resource management to the administration. Otherwise transport would be running ten loops of the same bus every day without any knowledge of where the density is. Transport is at times underutilised for the simple reason that the last man is not connected. It can happen that the density of the population is elsewhere and the busses are plying in a different direction. So the question to answer is how can I actually get information on that population and the heatmap and marry it with the transportation logistics.

We take solutions from you – the Makers community – put them together and create an architecture around that. Next we also try to do some pattern analytics between multiple data points that are coming in.

At the very basic level there are a bunch of sensors sending in data. Multiple sensors are feeding information and they're correlated. What Intel does is once we have this first level technology built, Intel also has something known as Edge Analytics. You don't have to send all this data back to city centre or a centralised command centre or a data centre because this may be something that could be actually controlled right at the location.

1 What's the advantage in not having it centrally analysed?

Kavitha: Bandwidth and security con-

Building Smart Cities with Intel

We speak to Kavitha Mohammad, Director, IoT & Smart Cities at Intel, Asia Pacific Japan to get a pulse on how Intel plans to build the technological backbone required to support the smart cities of tomorrow.



Kavitha Mohammad
Director, IoT & Smart Cities at Intel
Asia Pacific Japan

cerns. We're creating islands of intelligence. As much as possible if you can control and manage that island, you're actually doing yourselves a favour because you're controlling the data that's moving back and forth, your security concern is to some extent mitigated because it's not going on to a public cloud, and the cost of the bandwidth is also reduced to some extent. So that's the essence of it. A gateway solves the same things that the IoT community has been struggling with. Manageability: how do you manage multiple devices? Interoperability: how do you make sure that the different languages spoken are understood? And then how do you manage Security. These three are very important anywhere in the stack. If you look at the Intel architecture, we have intelligence in the sensors. The Edison that you spoke about for example, it has intelligence built into it. There is also a programmable chip that's coming into play. You don't need to program from a different operating system or console. The chip itself is a FPGA programmable chip. The Gateway handles multiple sensors and it has an operating system built onto it. The operating system will help you program these and it has security and analytics built into it. So the edge analytics island I was talking about earlier is taken care of here. And at the next stage in the stack, many such gateways then come onto a communications network.

1 And these gateways are Intel gateways?

Kavitha: These are intel gateways yes. The OEMs are different, but the underlying chip is Intel.

1 And the OS?

Kavitha: It's a Wind River OS. I'm not sure if you've heard of it but this is the OS that's being used on Mars.

1 How much of our critical infrastructure should we put on the grid?

Kavitha: That's where the security protocols come in. It's a given that there would be one or two corner cases, which might get missed. But the value that you're generating out of putting something on a grid probably far exceeds that. **1**

(full interview at dgit.in/IntelIoTdg716)



Warcraft movie takes crown

Warcraft has officially become the highest grossing video game movie ever, thanks to China <http://dgit.in/wrcrftmv>



I Sea app pulled

I Sea, an iOS app was pulled from the app store after reports that it didn't actually work <http://dgit.in/appnowork>

Industry Connect

ARM's RISC-y real time computing

Lesser known than its speedier A series chips, there's a new star in ARM's Cortex R lineup, the Cortex R8. It's a fast-paced CPU that can be deployed in a variety of storage, networking and cellular data operations. We spoke with Neil Werdmuller, Product Manager at ARM, about what makes Cortex R8 so great!

Jayesh Shinde
jayesh@digit.in

Any scenarios where all three Cortex A, M and R processors are working in unison?

Neil: In a mobile phone, it's the most complex example. But, often today, to run Android, you have the Cortex A series processors running that OS, upto Octa Core or even above, now. Behind all those core, you can manage the power consumption very well, run it in Idle mode, with a single, small core, and fire up the big cores, when you need the performance. But, underneath that, the modem is Cortex R, so even before Cortex R, the modems were traditionally being using real time processors as well. In total, in terms of how many cellular modems have used ARM technology is more than 20 billion. It's amazing when you think about it, it's almost 3 times the number of people on the planet.

And we assume that number is only going to go up?

Neil: Yes, I mean, what we see, with more and more subscribers. But also, it's not just about having their own mobile phones, we're also seeing their cars having their own modems, laptops having the ability to have LTE and 5G built in. The internet has things as well. I think the LTE, they're clearly going to sync things running on smaller technology like WiFi or Bluetooth. I think you're going to see a huge growth in the number of modems that are there. It is exciting, and a very big growth area.

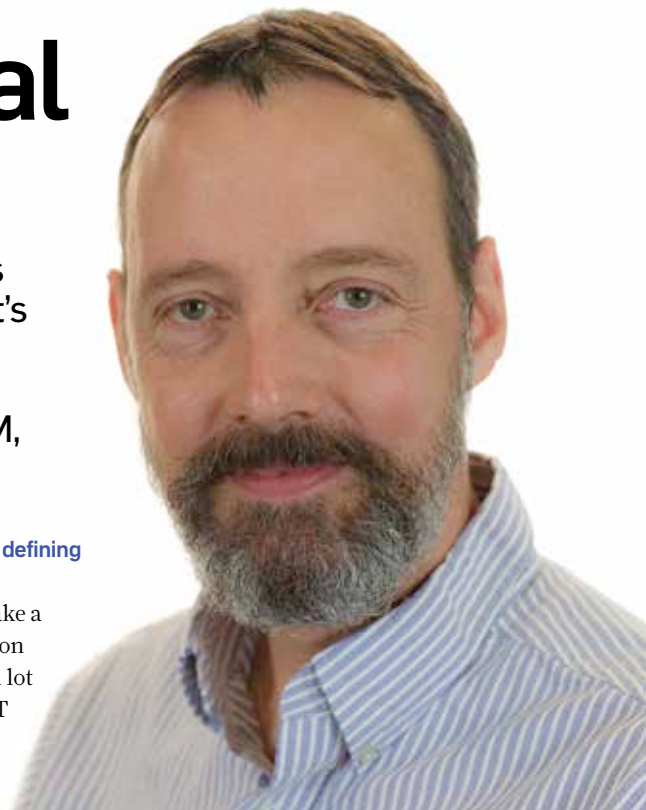
Is ARM playing an active role in defining future tech standards?

Neil: In some of the areas, we do take a reasonably active role. It depends on some of the standards. There are a lot of them. Some of the emerging IOT ones. We're working with a lot of operators as well, because in IOT, there are lot of different competing options, at the moment. From the LTE standards coming up, to the LTE standards now, and LTM, and it's increasing quite rapidly. We understand what's coming, and we make sure that the processors are available at the right time for that to be there. 5G hasn't been defined, but we're having to develop processors now, that cater to 5G, because when we launch a processor, say in February this year, it will probably take a year before the processors are really in working modems. So, it's kinda chicken and egg. So, we make sure the egg's available at the the earliest.



What are some of the emerging trends that you see coming out, that are probably at the inception stage?

ARM: Wearables, a diverse range of wearables, are very interesting. Some of those are the obvious fitness trackers, but I think in some of the areas, they already have dramatic changes. If you want to start monitoring diabetes, for example, just remotely, and you can manage that, So, probably, my personal view, rather than ARM view, is today a lot of this high tech is great with connecting people, playing games, social networks, but I do think as



Neil Werdmuller
Product Manager, ARM

we move into IOT and wearables, it's really gonna have some major benefits in other areas, like health, and lot of those areas.

On behalf of our younger readers, what sort of skill set is required if you're going to be employed in the next decade?

Neil: I see that, by definition, these are embedded devices. So, whether it's a fridge that's connected, or whether it's a sensor in a meter, it's all about small and efficient code, making Cortex Ms very power efficient. I think (it is) at the moment one of the areas that are all gonna require like C programming. There is a really pending skill shortage in embedded, and understanding how to make all these small devices, make them really efficient, really reliable. I think people can generate very specific skillsets on how understanding how sensors work, and all these different things. At the low level, i think it's important to know how to bring them up and make them work. There's gonna be huge variety of devices, and there will be huge opportunities, for anyone who understands the technology.



Live Vids on Tumblr

With everyone else joining the fray, Tumblr has decided that it too wants in on the live video dept <http://dgit.in/livetumblr>



Even the depths aren't safe

The World's deepest point, the Mariana Trench is also reportedly full of garbage <http://dgit.in/trenchtrash>

High-performance GPU compute

NVIDIA and VMWare talk about how they're taking GPU-based computing to a whole new level in the enterprise space



Jayesh Shinde
jayeshb@digit.in

GPU virtualization is a tough cookie to crack. Could you shed some light on that? And is VMware's decision to partner with NVIDIA based on the fact they occupy a dominant market share, or is there something in their technology that is better than their competitors?

VMware: That's a very good question, but from a leader standpoint, NVIDIA is the market leader, when it comes to graphics virtualization. There are other vendors also in the market, they have also had support compatibilities, what they're creating with VMware and our vendors.

More or less, the moment you think about graphics, the first name you think of is NVIDIA, and there is also the innovation. Look at the amount of work we do, among NVIDIA and VMware. It is phenomenal. It is not about a product to product partnership, we do co-engineering, between these companies. We ensure that the technology seamlessly integrates into the virtualization technology, so the customer can get the wonderful experience, when they're actually working on this. We ensure, in fact, we will talk more on the NVIDIA side, we went into the extent of try grit. If you have a problem with something, on the cloud, you can request for a desktop, it's at your fingertips, and it can run the most complex applications, whether it be 2D or 3D apps, and then you can look into the performance, and take a decision.

I was going through your documentation, regarding VMware Horizon 7, and seems you've implemented a new profiling

protocol called Last Extreme. How exactly is it advantageous compared to the existing protocols in the TCP/IP space?

VMware: You know that protocols in the past, like RDP, TCP/IP, these are all like the proprietor protocols that they've built into it. What happens is, in these technologies, we all think of Netflix as a company. In the US, I see this trend of Netflix, you buy a \$20 device, which is Android based, and you can comfortably watch a movie on those small devices.

Do you know how is it possible to do that?

VMware: What they have done is, instead of creating proprietary technology, they've used a lot of this technology on these underlying platforms

like Windows, Mac, or Android, and iOS, or any other device in the market, today. One of the common thing in the market today is the X.264. The advantage here is, if you look into the TCP/IP, or RDP protocols, these protocols use coding and encoding, and encrypting and decrypting, because at the end of the day, you're rendering pixel form data to an endpoint device. Decrypting is done in the data center, and you're just seeing the pixels, and you're actually interacting with that, and the execution is actually done in the cloud, in case of desktop virtualization. If you really see this, the protocols use a software mechanism, that means you install a client software, on an endpoint, and both the

encoding and the decoding will be done on the software layer. Today, the reality is, we all carry mobile phones, when you want to download any application on your phone, the first thing that you ask is how much battery does it consume? Users want an app which consumes less battery life, less battery, and is able to comfortably run for many hours.

Speaking of Codecs, we know that H.265 is now the upcoming standard in all low wattage devices. Even small 4 watts, or 6 watt embedded processors have support for X.265. That's one advantage of using X.265 over X.264.

NVIDIA: Moving on to the part where graphics intensive apps are required by the user. Here, in the market today, if you categorize into 4 kinds of users - which is typically what we do - we start with task workers. Task workers are basically the users who use apps like SAP, Taskforce, Windows, PowerPoint. These are the things categorized as task workers.

So what is it, in VMware, three years back, before NVIDIA, we were pressured by consumers who said, that they can't use a computer without graphics. VMware is a known company for virtualizations. Anything in the world you want to virtualize, we do it. We did something called software based 3D around 3 years back. That's the one that basically help you with play-doh kind of apps to work on.

When you move on to knowledge workers, people use OpenGL, DirectX applications. The next level is power users, people who use Adobe. Then in the Designer levels, there's Siemens, AutoCAD, which are really high level. **I**



Ramesh Vantipalli
VMware



Sundara Ramalingam
NVIDIA



PS Vue on Roku

Sony's PlayStation Vue TV service is not available on Roku on TVs set-top boxes
<http://dgit.in/vueonroku>



Mrs. Obama joins Snapchat

Michelle Obama has joined Snapchat and is giving her followers snaps of the white house and her activities <http://dgit.in/MsObama>



Akamai on gaming security

Gaming companies are increasingly storing more information on the cloud and delivering content on a requirement basis to the end user. With an influx of new users, comes the need for more security

Mithun Mohandas
mitbun@digit.in

Q We know that Akamai is primarily a CDN. We recently also found out that Akamai has a play in gaming enablement. What can you tell us about that?

Akamai: So, in gaming we do a lot of things. Me, specifically, I'm the Chief Technology Officer of Security for all of Asia. We have customers that get attacked all the time. So we built a response team to go help respond to such instances. Apart from that say you want a mobile game, we're the ones that deliver it to you. There are lots of games that have DLC (Downloadable Content), and even large updates to the core game. Developers use us to deliver that, because, there's no traffic to the sites that have their downloadable content, and then they release it, and everybody wants it at once. We do quite a bit for the console manufacturers; things like the registration process for the device, the management of the user's online account, all of that takes place through our servers, depending on which particular platform it is. Then, pretty much a slice across all that.

Q What are the key challenges with the current ecosystem?

Akamai: For India it's definitely on the mobile side. On the mobile side, there are lots of people writing games, and the barrier to writing games is very small. But you'll have publishers that will write a large number of games, and they don't know which ones will be successful. So, it's really hard to figure out how much to provision. If one game is very popular,



Michael Smith, APJ Security CTO Akamai Technologies

for whatever reason, and you actually need to have the resources to support that particular game. After the holidays for example we see a lot of users have new devices, and suddenly they're connecting them all, and downloading content. So, we have kind of this flash crowd, especially around the end of the year, and some of the other holidays. Ramadan and Eid for example are becoming holidays in their own right. You've got some attackers, out there. There was one holiday, like five years ago, where Anonymous decided that they were going to attack one particular game. But, it was just a casual, semi social game. They were actually going to crash it during the holidays, just with a simple DDOS attack, in order to force kids to spend time with their families. I actually might agree with some of the spirit of what they were trying to do there. But, officially, I can't. But really what it comes down to is: the resources required and the security knowledge. Gaming publishers, for the most part, depending on which publisher, might or might not have dedicated security resources. So, a simple thing is just account take over. If you look at account takeover, we see it in other places than gaming.

Users reuse credentials across multiple sites. Attackers know this. So, they'll do

a phishing attack, take over one of their e-commerce passwords, and then they'll use a tool called "Account Checker". If you go to YouTube, and search for "Account Checker game", you can videos in which people are demoing their tools, and recording it. They'll take a list, and it's usually username or email, and then to get the password, they'll look it up in the tool, which will go through a series of proxies, and see which one those it can actually log in to. Then the tool reports back to the attacker, and then they'll publish these on different sites, or they'll log into the account as the user, and find some way to cash out the user's account. So these are checking out, gift all of the user's goods to someone else, they'll see if the user has a card stored, buy material, find a way to have it shipped to them, then sell it on eBay. Basically, whatever way they can cash out of the account, they'll go do that. But, we've seen that it's almost a pandemic, at this point. It's surprising to see how heavily it's happening within gaming.

Q We've heard these hackers are a tough bunch and they have an arsenal of constantly evolving techniques – those that are run remotely and those that are client sided. These client sided techniques take effect before even the data reaches Akamai's servers. So how does Akamai combat these techniques?

Akamai: If you understand the way that our servers work, users follow a DNS to get to our servers, and then they make request, so we function like a proxy. So, in line there, we have a web application firewall, we've had it for about 6+ years, almost 7 years. It basically adds a security policy, on top of the delivery configuration. So you can look at a source IP address, and then when they send too many login requests, like say five requests in 5 seconds, there's not a human attached to that. There's some kind of automated program. So, you can lock them out for 10 minutes. Or you can require that the request looks a certain way. **Q**

(For full interview head over to dgit.in/akamaidgtjly16)

डिजिट अब हिंदी में

देश का सबसे लोकप्रिय और विश्वसनीय टेक्नोलॉजी वेबसाइट डिजिट अब हिंदी में उपलब्ध है। नयी हिंदी वेबसाइट आपको टेक्नोलॉजी से जुड़े हर छोटी बड़ी घटनाओ से अवगत रखेगी। साथ में नए हिंदी वेबसाइट पर आपको डिजिट टेस्ट लैब से विस्तृत गैजेट रिव्यू से लेकर टेक सुझाव मिलेंगे। डिजिट जल्द ही और भी अन्य भारतीय भाषाओ में उपलब्ध होगा।

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डिजिट

PLAYED

- **Witcher 3:**
Blood & Wine
- **Total War:**
Warhammer
- **Battleborn**
- **Homefront:**
The Revolution

MOAR

- How hackers shaped the video games industry

SKOAR!

LIVE TO GAME

VOLUME 14 * ISSUE 07 * JULY 2016
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DRESSED TO PLAY

How to master the art of cosplaying



E3 2016

The announcements that really mattered this year!



120 DOOM



122 Total War: Warhammer



132 The Art of Cosplay



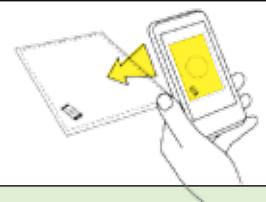
137 Hacking: A gaming menace

MOAR

- 117 | Mobile monthly
- 124 | Witcher 3: Blood and Wine
- 126 | Homefront: The Revolution

- 128 | Battleborn
- 130 | E3 2016: What happened!

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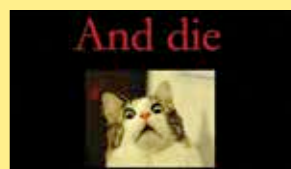


SKOAR!
Original

Whenever we get especially inspired by a gaming moment, we try to share it on our Facebook page. Take a look at some of the stuff we've created so far.



When someone says HL3 is dead
Duration: 8 sec
Say what you want to a PC gamer, but never, and we mean never, say that a certain Valve game will never release
<http://dgit.in/SKOorg1>



The impenetrable shield
Duration: 2 min 14 sec
The prophecy foretold the presence of a Greatshield in The Division. We had high hopes! Boo-hoo-hoo...
<http://dgit.in/SKOorg2>



How pro gamers play CS
Duration: 21 sec
Team SKOAR's busy leveling up the CSGO competitive ladder. And they just recently learned how "pros" truly play.
<http://dgit.in/SKOorg3>





Mobile Madness

Try out these games on your smartphone you must!
By Anusha 'Trillian' Sinha

Redcon

Redcon has been created by Hexage, a developer of some truly awesome games like Radiant, Reaper, Radiant Defense and Everlands. Like some of the other strategy games by them, Redcon too requires a rigorous application of the player's analytical skills. Redcon is also avail-



ble on Steam. The aim of the game is to ensure the continued existence of an Empire State established by a 'Führer' in an alternate reality where the First World War never ended. The major threat to the State are the rebellious Krux forces led by the traitorous General Kranz.

The game features really distinctive graphics; with towers and military outposts silhouetted against gloomy, overcast skies reminiscent of Badland and bunkers and various supply rooms which are more like those found in Fallout Shelter. Explosions are brilliant flashes of colour and every new landscape is exquisitely designed.

Redcon is an absolute must for all fans of tower defence, strategy and brilliantly made games.



Sky Force Reloaded

For anyone who hasn't come across the original Sky Force, Sky Force Reloaded definitely deserves your time and phone memory.

Sky Force Reloaded takes a classic scrolling shooter and makes it much more refined to create a game which holds its own amongst a series of almost identical games. The graphics are top-notch, with incredibly detailed 3D landscapes and glorious boss tanks which take up half the screen. The bosses are magnificent and equipped with a range of weapons. This only heightens the pleasure of taking them down.

For players of the original game, this rendition might be enjoyable or an utter disappointment based on the level of difficulty you prefer. If you're looking for a cakewalk, you won't find it in the newer version. There is an incredible variety of enemies to face and this makes the game satisfyingly challenging. Sky Force Reloaded is an outstanding game which merits your attention. Period.

Cars Battle

Imagine a dangerous demolition derby with a hundred cars where each driver has only one objective: to kill all others and remain the only one standing. (Sort of a vehicular Hunger Games, if you will) These drivers will go to any lengths, chasing their opponents into clouds of noxious gas to extinguish their spirit. And it's not just ordinary bumping into each other that they are keen on, they also have weapons, like the spectacularly modded cars in Mad Max. Now, stretch that imagination just a little bit farther and remove all images of grit and gore and picture this derby happening in a sleepy little desert town. Also, your truck is more of the ice-cream variety than the monster. If you have been able to visualise this, you have a pretty good idea of what Cars-Battle is all about.



Despite the existence of similar games like Smashy Roads: Wanted, CarsBattle still manages to be uniquely entertaining. There are plenty of weapons scattered about and these include a machine gun and a bazooka. CarsBattle is a wildly delightful gaming experience that shouldn't be missed.



Mekorama

Many games after Monument Valley tried to capture the charming storytelling and captivating game design perfected in it but none succeeded quite as well as Mekorama. This game not only does justice to the aesthetics first exemplified by Monument Valley but really raises the bar to a whole new level. And there is no need to worry about your phone memory while getting this one, the entire game is packaged in just 5.2MB! There are no ads and no in-app purchases. The most you will encounter in lieu of ads is a request from the developer to repay his efforts.

Mekorama features a dazed, dizzy robot who must make his way to goals scattered across elaborately designed levels or 'mechanical dioramas'. These levels feature blocks of water, movable parts activated by buttons, stairs and little patches of greenery built from the bottom up. The protagonist is adorably designed and his shaky steps as he follows your directions make him even more endearing. The graphics are gorgeous with crisp details and clean lines adding a sense of solidity to its world.

An awesome feature of this game is the ability to create your own levels and share them with others using a unique QR code. This makes the game potential-

ly infinite. The level creator is immensely easy to use and anybody can make a new level within minutes. The best part of the game is that it actually challenges your mind. While the puzzles in Monument Valley were mostly based on optical illusions, those in Mekorama rely on simple interconnected mechanics. If you play only one puzzle game this month, let it be Mekorama. It is well worth it.

Cosmic Challenge

Cosmic Challenge features an expansive world of asteroids and planets where the racing track is not just dangerous, it is interstellar. The tracks wind about asteroids and barrel-roll near stars. The game controls are a bit iffy for a mobile game, however, you might not take much time to become comfortable with the new controls and when you do, you will relish how responsive the ship is to your every tap and tilt. Cosmic Challenge is a rewarding game in the long run because you will actually have to build your skills to get better at it. Many mobile games require you to just

shut-off and press a button mindlessly which ends up yielding an experience which, while not being very challenging, showers the player with points for instant gratification.

Cosmic Challenge, however, does no such thing. You will have to fight your way to the top rung of the extra-terrestrial racing ladder.

There are plenty of ships and upgrades available in the in-game store. A great plus point, also one that it share with Mekorama, is the ability to create your own levels. The game is almost as fun as Riptide.

Cosmic Challenge is the game for you if you are tired of racing on just plain ground. Why race on Earth when you can race among the stars?



Big Hunter

Big Hunter is a minimalist game about hunting down a mammoth, not a task to be undertaken very lightly. The story behind Big Hunter is that the leader of a Bushman tribe has to venture into the outback and hunt a

mammoth every day in order to provide food to his tribe. Before going any further, we must address the elephant in the room. Yes, the premise is fraught with historical inaccuracies but who cares as long as the game is fun. Which it is, incidentally. If you thought to fight with a big, hairy pachyderm would be boring, you were wrong! The brave tribal leader ventures into the outback every single day and faces the murderous beast with a cautious smile on his face.

The design is minimalist, and the soundtrack is upbeat and lively.

There are only two controls, a tap to make the hunter retreat and another pull back and release mechanism to aim the

spear right into the mammoth's head. The health points of the mammoth increase with every day and it becomes progressively harder to kill. Along with this, the game adds different restrictions like time or limits the number of spears you can use to add some more intrigue to the game.

The tricky part here is timing the retreat and the launch of the spear carefully so no weapon is wasted by getting deflected by the tusks of the woolly beast. The mammoth gets more and more enraged the lower its health goes and comes charging after the hunter. If you are not quick to retreat, the mauled mammoth tosses you around. What fun!





Nonstop Knight

Nonstop Knight is about a knight who is relentless in his crusade to rid the dungeons of its careful assortment of monsters and the like. The cinch or the benefit (depending on perspectives) of this game is that it requires you to do very little. The only control that you have over the knight is limited to choosing upgrades and special attacks. The knight keeps on slashing through the various monsters and all you can really do is observe as your tiny protagonist rakes in the moolah and continues fighting without much assistance from you at all.

The game has splendid graphics, with bright colours accentuated by neon ones and cartoonish monsters which include mummies and trolls. The focus of the game is collecting



MMX Hill Climb

MMX Hill Climb is the successor to MMX racing, the hugely popular monster-truck racing game. MMX Hill Climb features monster trucks as well, but this time around the objective of the game is to guide them up tracks built into a treacherous hilly terrain. There are a huge number of tracks available for you to try your skills on. The controls are super smooth and guiding the truck across tricky roads is almost a breeze. The roads themselves are filled with all manner of objects and hurdles like beach balls, traffic cones, abandoned piles of pipes and whatnot.

There is a lot of choice available as to which vehicle you can choose and these are unlocked by the standard mechanism of using in-game coins or paying actual money for them. The vehicles include the Big Rig, a tank and the Muscle Classic, among many others. Each race in MMX Hill Climb pits you against another player who is either a friend or a random player from anywhere in the world. You witness the other player navigating the tortuous track along with you in real time. This way, the competition is always fierce. There are only two controls, one for acceleration, which lends the vehicle a right tilt while in the air and another for the brake, which makes it turn left.

The game has a robust physics engine and this makes its presence felt in the way the car bounces over the tracks or bumps into the obstacles. The graphics deserve special mention and are as good as that of MMX Racing. The cars are bold, bright and outrageous and even the backgrounds are pretty detailed. However, despite its cartoony feel, this game is no cakewalk. It's a true racer's game, with just the right amount of zing to it.

Air Attack 2

Air Attack 2 is another scroller shooter but with a difference. The scrolling is not just vertical and the plane veers around corners and in circles automatically. The player still retains partial control during these times. The lack of control during turns is more than compensated for by the added layer of movement brought by it. Instead of just moving forward in the single file, now your plane barrel rolls over European cities in a bid to bring down the Axis powers. Another major difference between Air Attack and Sky Force Reloaded is the addition of a historical context to the former.

Air Attack 2 is easily one of the best designed mobile games out there. The attention to detail is singular. Entire cities with ornately designed houses and cathedrals lie far below the planes and the continual dogfight in the skies. The explosions are highly pleasing and towering buildings are destroyed in a vibrant flash of light and you can actually watch each individual part disintegrate. Planes careen down into the city after being shot and slowly become smaller, accurately conveying the illusion of depth.

The game is filled with little surprises. For example, in one level the plane actually enters a factory building and



proceeds to take out the guns and flamethrowers contained within it. Although Air Attack 2 does have a small advantage with its spellbinding graphics and tiny innovations, both games are pretty amazing. *



armours and weapons and building 'skills' to kill bosses. Depending on how much you like clicker games, Nonstop Knight is just the game for you or something to steer clear from.

You can constantly upgrade your knight and climb up your way to the top of the leaderboards. One advantage that this game has got going for itself is that it can be played without an internet connection. This makes it ideal to be played for really short durations on a fairly regular basis.

Another feature is that your knight is nonstop in the true sense of the word; he does not rest even when you stop playing. As a result, there will always be a lot of loot to collect every time you come back to the game. The game's a lot of fun because who doesn't love watching a knight courageously take down the bad guys? Time for some medieval fun!



GUNS, GUTS & GLORY KILLS

The FPS genre has a new king and it has Doom written all over it

By Abhijit "babumshaaye" Dey



After suffering a disappointing response from Doom 3, Id has completely replaced all the scepticism from the franchise with its new title, and boy, it's been a long time since we loved a first-person shooter so much. The biggest contributing factor to this joy is the return of the fast-paced gameplay where you go berserk on demons with all the classic weapons making a comeback. But will Doom stay the reigning champion for first-person shooters, the way it did back in the 90s?

As you start up the game, it doesn't feed you a long background story and in no time, you're already crushing demons with your bare hands. The story is set on Mars where a corporation successfully makes contact with Hell, in an attempt to solve an energy

crisis by trying to harness demonic energy. Having played through several levels, it's not difficult to realise that the story is hardly the focus of the developers but more about the brilliant gameplay.

New weapon system

Already mentioned earlier, big guns are back including the popular Super Shotgun and the BFG, rocket launcher and plasma rifle. The new upgrade system adds a lot of additional functionality to rip apart demons which aren't essential since you'll still be able to mow down enemies in the barebone mode. But at higher difficulty levels, it becomes incredibly easier to die and these upgrades become advantageous. We spent most of the game with the Super Shotgun because of the satisfying recoil and

damage. Thanks to an upgrade, you'll be able to shoot double shots with the twin-barrelled shotgun, something unusual but so are the other weapons in the game. Doom's single-player mode isn't short, and having the upgrade system brings in a new mechanism every time. This ensures that the game doesn't become monotonous as you progress in the story. You'll have two modifications for most of the weapons to be switched in-game. These modifications can be upgraded through Field Drones spread out across the map, not necessarily in plain sight. You'll also come across upgrade points for your primary suit to increase your maximum health, armour and ammunition. In order to hit new weapons early, you'll have to do a lot of exploring since some of them are hidden away from the basic



path to your next location. But the developers have gone easy on us by placing the weapons later in the game. The weapon system is rewarding when you kill using the chainsaw since it drops a lot of ammo.

G(I)ory kills

To break away from just letting you put bullets into the demons, id has implemented the Glory Kill system, and they are a treat to execute and watch. Essentially, when you've dealt a lot of damage to a demon, they start glowing blue and as you near them, they glow orange, which is your cue to tear them apart with your bare hands in a grotesque way. These kills aren't only for your viewing pleasure but they have an added mechanic of dropping health that has managed to save our lives several times while facing demon waves. Glory kills are different for each demon and trust us when we say that you won't get tired of using it over and over again. There are multiple animations for them, dependent on the location and body part you aim before going for a glory kill.

Levels and demons

There's a lot of verticality to the game, and double jump enhances exploration. The levels are huge, with a lot of area to cover, and the more you explore, the better chances of having

your health and ammo bar always filled up. Movement feels smooth throughout and they have incorporated nostalgic Easter eggs in the game that you wouldn't want to miss. One of them includes small areas from the original 1993 Doom game preserved with the same graphics. One such area is available in every level and you'll need to keep a lookout on a lever that opens up a wall somewhere on the map. After a quick breeze through a couple of levels, you'll be convinced how the game encourages you to look around every corner of the map, since at times it becomes your only hope to stay alive. Another advantage to enter-

TESTING RIG

MOTHERBOARD: AsRock Z170 Extreme7+

CPU: Intel Core i7-6700K

RAM: Corsair Vengeance DDR4 (2x16GB)

GPU: Zotac GTX 980 AMP! Extreme (Graphics), Zotac GTX 970 AMP! Extreme (PhysX)

STORAGE: SanDisk Extreme II SSD

PSU: Corsair HX1050

MONITOR: BenQ BL3201PT

MOAR

DEVELOPER: id Software

PUBLISHER: Bethesda Softworks

PLATFORM: PC, PS4, Xbox One

PRICE: ₹2,999 (PC), ₹3,199 (PS4), ₹3,499 (Xbox One)

ing every crevice you find on the map is coming across their hidden (not too hard to find) rune trials. The rune system gives to access to special abilities and power-ups that can be equipped from the inventory.

Blowing up demons and pulling their limbs apart is a gorily beautiful affair because of the way it has been implemented. You'll come across a new demon at every level, and once you're aware of their abilities and movements, they appear in hordes later and show no mercy. Further in the game, you'll also have boss fights, an essential part of a DOOM game. When waves of demons attack, your best bet would be to never stop moving. You'll be losing health drastically and while you shoot them down, you will need to keep collecting health and ammo on the way. Horde fights occur at huge arenas which can be scaled vertically and once you collect the Jump Boots, double jump highly affects the gameplay. Some levels do include a lot of jumping over to platforms and stone slabs, especially in Hell, but once you've mastered double-jumping, it becomes easy.

Performance

Speaking about the performance, Doom doesn't fall short anywhere. At times, you'll be surrounded with hordes of different types of demons in rich dynamic environments but we didn't witness any stuttering or tearing. "PC gaming is in our DNA here at id", says a blog post from Bethesda and they have rightfully delivered. We ran the game on an i7-6700K machine with the GTX 980 pushing graphics and a GTX 970 tackling PhysX. On maxed out settings, we were able to achieve about 160 fps at 1920x1080 resolution while we hit a maximum fps of 40 on 4k resolution. Sometimes, we observed the framerate capping at 60 fps even though V-sync had been turned off. Upon investigating online, the temporary fix was to switch between windowed mode and back to fullscreen mode. Other than that, there weren't any qualms. *





The marriage between Total War and the Warhammer universe has given birth to arguably the best Total War game yet. Here's why...

By Manish "Trigger-Happy" Rajesh

The Total War games have been around for quite a while now and they're well known for their historical accuracy when it came to replicating war campaigns of the past. In fact, all these years that has been their primary selling point. Naturally, when it was first announced that next Total War would be set in the Warhammer Universe, many doubted about how that would turn out. All we can say after playing it though, is why wasn't this done sooner?!

Factions

What you'll immediately notice when you pick up Total War: Warhammer is the factions. Well in this case, it's more like races. There's four playable fac-

tions in the game, i.e., The Empire (or the humans), The Greenskins (or Orcs), the Dwarves, and The Vampire Counts (or the undead), and there's Chaos as well but they're playable via DLC. But unlike previous Total War titles, there's a huge disparity between each faction's units and skillsets. They even interact with each other differently. Humans can be more prone to the fear inducing units of the Undead or Chaos factions than the Greenskins. At the same time, while the Humans would never form an Alliance with the Chaos faction, the Undead don't really mind too much.

Each faction has some unique aspect about itself that makes playing as them all the more enjoyable, if you figure out how to utilise it that is.

These aspects also hugely change the approach and playstyle a player would have to use when playing as each of these factions, ensuring that no \two factions feel alike.

Take the Greenskins for example, they have a separate meter that measures the "Fightiness" of their armies. To raise your Fightiness you need to keep on fighting and winning. Stop fighting or lose too often and it goes down. Once your Fightiness is high enough, the Orcs will actually band together and form a bonus army called a "Waaagh!". While maintaining and raising multiple armies is a huge expense for other factions, the Orcs can get them for free, which encourages players to continue their attacks, keeping true to the nature of Orcs.



Similarly dwarves have a “Book of Grudges”. They won't be forgetting anything or anyone who's wronged them anytime soon, and exacting revenge on anyone in your Book of Grudges will get you bonus rewards. At the same time, letting too many grudges pile up will cost you with a drop in public order..

The Vampire Counts primarily want to spread their corruption across the land. Other factions suffer attrition damage when traversing over corrupted lands. Similarly, undead armies also suffer from attrition damage when not on corrupted land. This basically ensures that players will want to expand in order to spread corruption and move farther without suffering attrition damage. Furthermore, the undead can instantly replenish their numbers by raising dead without having to wait or spend turns recruiting like other factions, however they cost more than the traditional method and they're limited to a weaker tier of units. But in provinces where large battles have taken place, a more powerful tier units is available to raise, you know, because of all the corpses.

The Empire faction is where old time Total War players will feel most at home. They have recognisable units that players will feel slightly more familiar with, such as knights and spearmen, than compared to say a Vargheist or a Hexwraith. Also they're better at diplomacy than other factions, naturally. It's not surprising to see The Empire forming alliances with neighbouring city-states and establishing trade routes and such.

What we can derive from all of this is that each faction is unique and warrants a different approach and play-style in order to succeed. Unlike previous Total War games, your Lords, Heroes, Generals, Agents, whatever you want to call them, actually feel relevant and impactful.

Story and Battles

It's a Total War game, of course it has a campaign, but what's important to note here is that there's an underlying



MOAR

PLATFORM Windows, Linux, Mac OS

PUBLISHER Sega

STUDIO Creative Assembly

PRICE ₹2,499

CONFIG Intel Core i7-2600k, 16GB RAM, Nvidia GTX680 (2GB), 55GB SSD, 1TB HDD, Logitech G105 Gaming Keyboard, Dragon War ELE-G9 Thor Gaming Mouse



story in there as well. The story of the Lord you picked to lead your faction. Story markers which represent battles will pop up on the map as you progress with your Lord, and will offer powerful items to aid your Lord decimate his foes. These aren't easy battles and often times these markers may appear half way across the map, so you might actually miss out on the story. Which kind of sucks since they're actually quite gripping and the rewards aren't half bad either.

Next we have the battles. You should note that this is a fantasy game, so expect to see Giants tossing armies aside and magical spells being hurled about. Each faction have their own advantages and disadvantages, and magic did not have as much of an impact as we thought it would in this game's universe.

Technicalities

Total War: Warhammer suffers from some of the usual quirks that most Total War games suffer from- its AI

and its camera. While the AI is comparatively much smarter than previous Total War titles, they could be exploited, especially when it came to diplomacy. Another thing was the camera, you can only zoom out so much before it took you to the tactical view. While it's tempting to zoom all the way in and watch the action up close, one needs to keep an eye on all armies and that was hard to do when the camera could only zoom out so much. Despite this the world of Warhammer looks amazing. You can easily distinguish parts of the map and while it is a large map, factions are limited when it comes to expanding.

Overview

It's rare when a strategy game keeps you vested right from the start all the way to the end, but Total War: Warhammer has managed to pull it off. Any who doubted that a marriage of Total War and Warhammer would not work, well you can clear those doubts, as it has worked splendidly. *



OF BOOZE & WITCHERY

Witcher 3's Blood and Wine packs more action in an expansion pack than most full-priced games

By Videep "fr4k" Vijay Kumar



One thing's for certain: we're not going to be seeing much more of Geralt after Blood and Wine, and arguably, that's the most disappointing thing about The Witcher 3's second and final expansion. This is CD Projekt Red saying goodbye to the monster slayer who has stolen many hearts and minds (literally, on occasion).

Blood and Wine is not necessarily a game changer as it is a relative high point in the execution of The Witcher formula. The combination of powerful storytelling,

immersive world of Toussaint, emergent systems and consistent evolution of gameplay over the years reaches its peak in the latest expansion, while some minor annoyances do make appearances. But in the end, series fans have several dozen hours of Witcher content to sink their teeth into, and for those of you who haven't played The Witcher 3 at all, this is the perfect time to grab the game and its expansion to experience the complete story in one shot.

The masquerade

If you've played the base game before, you will be able to carry forward your

character into Blood and Wine, but a minimum level of 35 is recommended to kick off your journey. Like the game's previous expansion, you will be able to create fresh character at level 35 as well—a good option if you feel you need to re-spec all your stats and abilities. Your journey then begins in the noticeboard at Mulbrydale—a quick chat and skirmish will ensue, after which you are taken to the wonderful, charming new area of Toussaint, a picturesque, high-fantasy take on the south of France, untouched by war.

It doesn't take long before you're thrust into action once again, and it's this sort of pacing that sets Blood and



Wine apart, even from the base game. There are beasts to hunt, mysteries to solve, gear to acquire and more RPG stuff to do. Toussaint is the quintessential Witcher realm—beautiful on the outside, with a dark underbelly.

The lazy detective

Geralt is tasked by the duchess of Toussaint to eliminate the mysterious beast terrorizing her lands. Investigating a series of murders is his first goal, deciphering a pattern and playing Sherlock Holmes to predict the next victim. During the course of twenty-or-so hours, expect to spend a fair amount of time doing a Witcher's work for meagre pay, but keep in mind that this is a sandbox game as

much as anything. There will still be plenty of time to laze in your own vineyard, ride around aimlessly on horseback, or more importantly, get some Gwent practice in before the standalone game comes out. There's an all-new Skellige deck with over 40 cards, and a tournament to test your card playing skills.

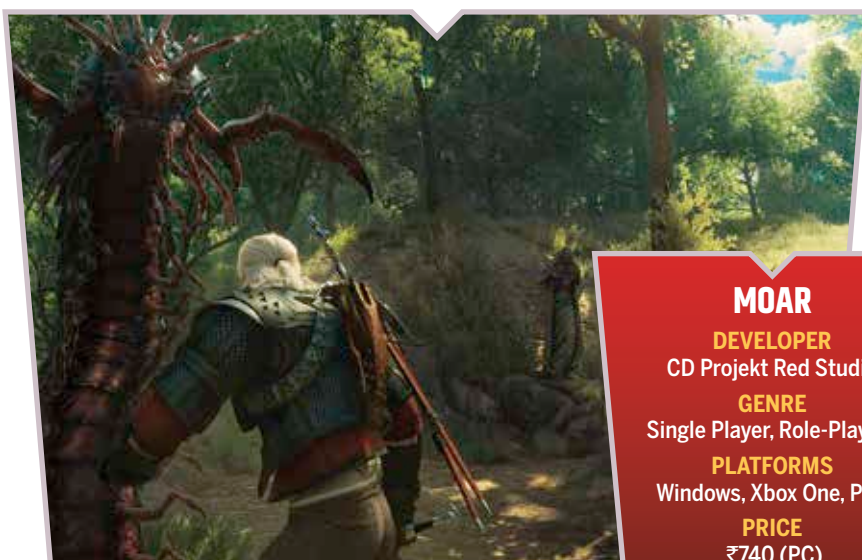
The fashion-conscious soldier

While it has been argued that combat is a weak point in The Witcher 3, I've always felt that it was easy enough to not feel too casual and complex enough to reward strategy. If you dislike The Witcher 3's combat, Blood and Wine is not going to change your mind, however. Expect to encounter a variety of ene-

mies which will require a fair bit of tactical play (pro tip: invest in Igni and Yrden this time and don't rely on Quen as much), ranging from hard-hitting brutes, crafty arachnids to fast-paced invisible apparitions.

Blood and Wine also introduces a new skill system which revolves around Mutations. Once you've completed a secondary quest, a new upgrade system will be available to Geralt. Unlock new skill slots and 12 mutations in total by using ability points or mutagens. Gain passive abilities, empowering melee attacks, sign intensity, offering speed boosts or dismembering foes with fatal blows. While only one Mutation can be active at a time, combining it with mutagens can give Geralt some crazy damage buffs.

An additional armour tier ("Grandmaster") is also introduced. These are not cheap to craft and diagrams are not easy to come by, but they have the best stats of all armour pieces. There's no other way to describe the visual appearance of these new armour sets other than "badass". So if you want to look like one, there's a bit of wandering to do, but it's worth it in the end. Blood and Wine also features armour dyes—some of which can be purchased at shops, while others can be crafted from diagrams. This was clearly a much requested feature by the community (plus the fact that a lot of us were running around with dumb-looking mismatched armour sets because of their stats), and it's good to see that it's in the game.



MOAR

DEVELOPER

CD Projekt Red Studio

GENRE

Single Player, Role-Playing

PLATFORMS

Windows, Xbox One, PS4

PRICE

₹740 (PC)

The Verdict

The Witcher 3 is one of the greatest RPGs ever made, and Blood and Wine is a fitting farewell to everyone's favourite pale monster slayer.

The story is superbly written and Toussaint is a wonderful setting for such a dark story.

Thanks to a combination of new features, improvements and refinements, the game hasn't been in a better state. Overall, Blood and Wine offers tremendous value for its price as it takes you on a gritty yet unforgettable magical journey. *



Homefront: The Revolution is a game which puts you in the shoes of a revolutionary, in the dystopian future, where America has been

taken over by the North Koreans, after a shady weapons deal orchestrated over decades with them went sideways.

That's enough about the story, lest I spoil it anymore, for any of you who may want to buy the game after you're done reading this.

Gameplay

The game is not without flaws. It plays inconsistently, and gets frequent

framerate drops. We reviewed this on the PS4, and it never gave us a consistent framerate. It ran jankily, and the only relief our eyes got, were the cutscenes, where the framerate somewhat stabilized.

Other than that, the game has combat mechanics which would immediately remind one of FarCry, with the constant looting, and scarcity of resources.

The game does a very good job at setting the atmosphere. People on the streets, the broken apartment buildings, and the general sense of gloom in the conflicted zones, where the revolution is in full swing. Which was in stark contrast to the clean, and pristine streets, with well dressed civilians, and collabo-

rators who will report you to the authorities, if you do any mischief, in the so called "Yellow Zones". The atmosphere is tense, throughout the game, and it doesn't feel like the game is trying to force the situation on you. You just sort of sympathise, with the cause. Yes, it's that immersive.

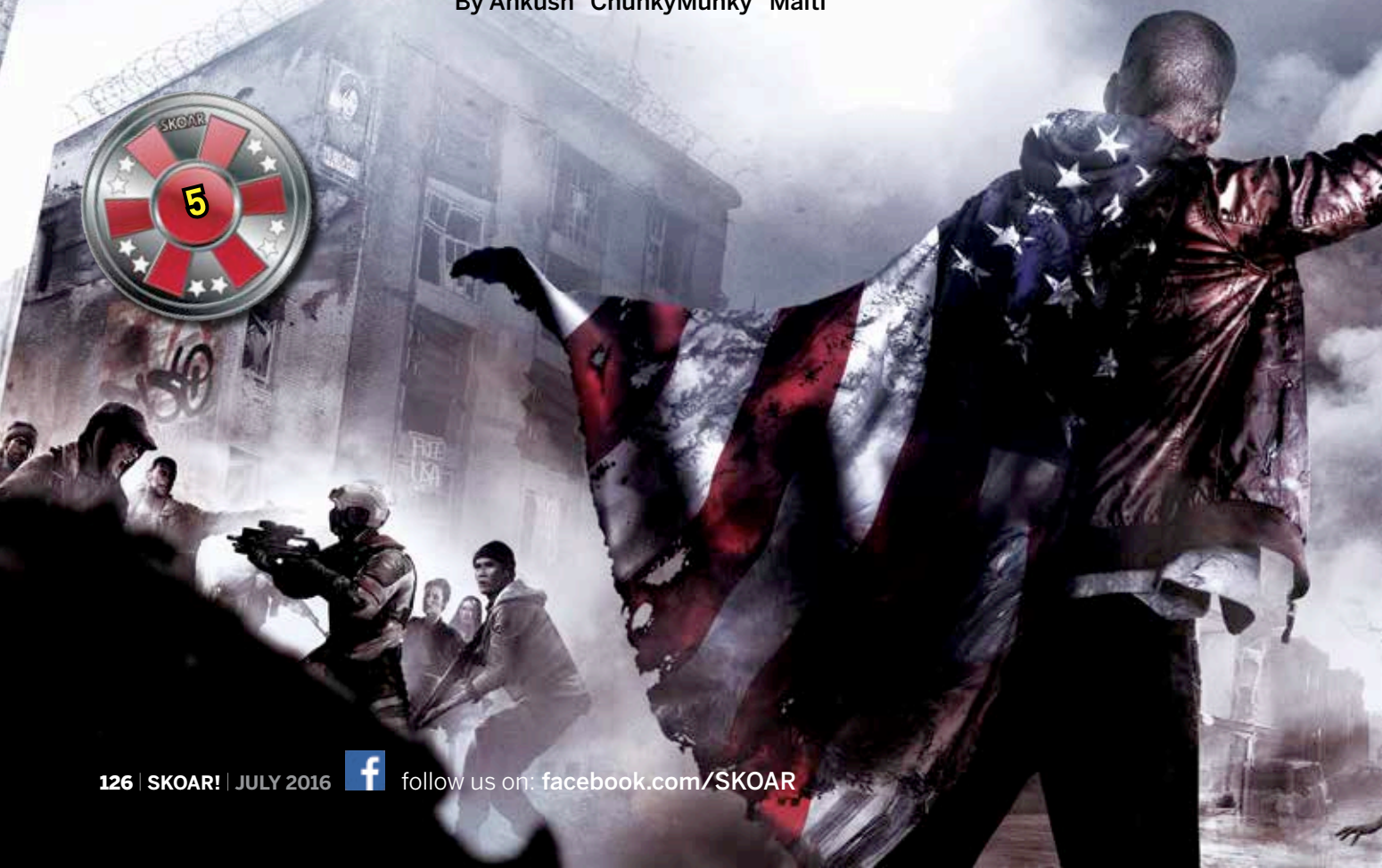
It has no PvP multiplayer, but it does have Co-Op multiplayer, which might make a few potential buyers a bit shy of buying the game.

You'd find it relatively easy to avoid fights in this game, so in some instances, the game forces you to look for trouble. To show off its gun mechanics, or to show how dumb its AI really is? We know not.

VIVA LA REVOLUCION!

Homefront: The Revolution does many things right, but it falters where it counts. Sigh.

By Ankush "ChunkyMunky" Maiti



Some of the missions require you to do a lot of pointless, and sometimes repetitive grinding. It almost gets too much, at one point, and we were this close to giving up on completing the game.

None of the story missions are really very remarkable, or memorable, and you can easily complete the game in around 3-4 hours, if you don't do any side missions, and if there wasn't any grinding to be done. It's not like the game doesn't have any side missions. It does, but it just doesn't give you any incentive to do them. If you're a diehard fan of the series, you might consider doing all of them to get the 100% completion achievement, and to unlock



some of the really cool, but unnecessary perks and gadgets.

The gun customization is one strong point about this game. You can turn pistols into smgs, at the quick press of a button. You can add, or remove scopes, and barrels, according to the need of the moment, and even do some crazy things, like turn a shotgun into a flamethrower. You can also turn a sniper into a freedom launcher and it shoots red, blue, and white sparks! (Murrical!)

Graphics

Before we say anything bad about it, the game has amazing visuals. Some of the vistas are truly breathtaking, and Deep Silver has done a really good job of making a war ridden Philadelphia look really, really gorgeous. However, it is not all fine and dandy. This is also the point where the game severely falters. We played it on a 65 inch, Full HD monitor, and the amount of screen tearing and slow texture rendering that we got was abysmal. Most of us got a headache, just watching the gameplay.

The framerate was inconsistent throughout the game. It got worse during the more graphically intensive scenes. At any point, if there's more than 6-7 NPCs on your screen, don't expect any framerate above 20 FPS. On a good day, the game does barely 30 FPS inconsistently. We realise that consoles are not exactly capable of handling graphics heavy games, and running them at anything above 30 FPS is a Herculean task for them, but games should run at a constant framerate.

Even textures rendered really late, and sometimes, we had textures rendering a few units away from the player character model. We assume that these issues are inexistent on the PC version, but as mentioned before, we reviewed this on the PS4.

Value for Money

For the amount of content it gives, and the quality it delivers, at ₹3,299, the game is overpriced. If it's priced like other AAA titles, it should give you the quality and finesse of the same.

Although, if you can pick it up for lesser, and the developers manage to fix some of the glaring issues the game has, go for it. If not for the gameplay, for the pure eye candy that the game is.

Conclusion

As of now, we wouldn't recommend you to buy this game, but if you managed to pick it up for a dirt cheap price, and you need something to do for a few hours, go ahead. It has a Co-Op multiplayer mode, so if you, and your friends own a PS4, (Or Xbox One, or a PC) you could team up with your friends, and waste a few hours killing North Korean peacekeepers, and exploring the vast expanses of a barren, war ridden Philadelphia, which, again, looks gorgeous. Even though the game does very little right, whatever it does do right, it hits it right out the park. It's the little things that make it good enough to be played, but not at the price it's pinned at, and definitely not, with the glaring framerate issues it has, as of now. *

MOAR

STUDIO: Deep Silver, Dambuster
PUBLISHER: Deep Silver
PLATFORMS: PS4, Xbox One, Win, Mac, Linux
PRICE: ₹3,299

PROS

- Good atmosphere
- Good graphics
- Gun customization

CONS

- Not very intelligent Artificial Intelligence
- Inconsistent framerate
- Lots of grinding and filler material



BORN FROM THE ASHES

OF FPS & MOBA

BATTLEBORN



Similar to Team Fortress 2 with a dash of Borderlands' crazy fervour, Battleborn works wonders at times...

By Hardik "fluffyVader" Singh

Battleborn is a fast paced, action packed FPS title with the potential to take on Team Fortress 2. At first, it seems like an advanced version of Borderlands in a new, online-only package, but it is not that simple. There are tanks, healers, and supports, and thus each team member will have a definitive role to play. The characters themselves are not that easy to kill, as is the case in FPS games usually. No one shot kills in this game. Oh no, sir!

All this makes Battleborn a little complex and far more fun to play. The game comes with a fairly steep learning curve. You will have to devote hours understanding the intricacies of each of the 25 playable characters, unlocking them by spending countless hours in-game, either playing story mode or multiplayer. Gearbox has done a fantastic job as the game's core FPS mechanics are bang on, given the Borderlands pedigree.

Drawn by a kindergartener

The first thing you will notice about the game is its cartoonish look and feel. It is full of bright colours. From the in-game menus to the actual gameplay, Battleborn consistently reminds you that it is made by the same people who made Borderlands. The game starts off with an Aeon Flux-like intro which is a bit long, but the intro song is mesmerising and gives you a glimpse of some of the characters from the game. However, the in-game animations are not consistent



and make you question whether they lend to the storyline. Sometimes, there is a proper 3D cutscene and sometimes it just ends up like a comic strip, with static images and dialogues in the background. If you've played the original Max Payne, you'll know what we are talking about except that Battleborn isn't that dark. The confusion doesn't end there, the level design looks bizarrely overdone. There are too many things to destroy and loot. Some levels have pathways over you, below you and some just don't lead you anywhere. Some worlds are bright, full of neon-like colours and some look pale compared to the others.

The MOBA element

The level design becomes even more complicated with the addition of shards. These glowy cacti like things serve as in-game currency, which you are required to collect in order to spend them on turrets, sentry drones and more. Now, in true MOBA fashion, these can be obtained by destroying stuff like shard boxes, exposed shard pieces as well as by killing bigger enemies.

Adding to the MOBA gameplay, each of the 25 characters has a helical skill tree with 10 levels. This does require some getting used to in the match-leve-lling system but once you have familiarised yourself with the gameplay and the characters, these level-ups feel far less intimidating and comes naturally. However, in the heat of the battle, keeping in mind, the mechanics of each character especially with the three abilities, the levelling system can become a little overwhelming.

Furthermore, the FPS style of Battleborn's MOBA element may not go down well with players who like the MOBA genre. All major MOBA titles such as Dota 2, LOL offer an isometric view of your character and the map. It gives you the sense of awareness over the different aspects of the game, such as



MOAR
 DEVELOPER
 Gearbox Software
 PUBLISHER
 2K Games
 GENRE
 Online FPS + MOBA
 PRICE
 ₹999

your teammate's position, enemy's position, game timer (to assess spawn times), cooldown counters and so on. Instead, Battleborn wants you to play the game in split-screen with a friend, which is certainly fun in an FPS fashion but not fulfilling as far as the existing MOBA style of gameplay is concerned.

Mindless killing

This brings us to the actual gameplay of the Battleborn. It is different, repetitive, fast-paced and full of forgetful NPCs. All gameplay modes require you to kill enemy NPCs, it doesn't matter if you are playing a co-op campaign or trying your hand at multiplayer. The storyline is about saving the galaxy, if you care about those things.

Comprised of eight loosely linked missions and three multiplayer modes, Battleborn struggles to maintain a balance between FPS and MOBA. All game modes with the exception of 'Incursion' are filled with objectives which direct you to 'kill this' and 'save that', leaving you with little-to-no free

movement while exploring areas of the map or farming for shards. While you end up pursuing these objectives to clear a particular level, waves of spongy enemies are thrown at you. In Battleborn, all the MOBA style elements, though replicated well, don't add anything noteworthy to the gameplay except for some rare nail-biting moments.

Out of all game modes, 'Incursion' is the only game mode which is able to stand out by offering Quake III Arena style gameplay.

Characters

Previous Gearbox games, especially the Borderlands franchise, had well-polished characters which the players could connect with. While Battleborns (Yes, the characters are called that only) do not have that same connect, they are still pretty interesting. Unlike any other game we have played in the past few months, the 25 characters in this game offer one of the most unique gaming experiences. Coming from a DOTA 2 background, I felt a bit uneasy and even frustrated initially as I adjusted to the mixed gameplay style of Battleborn. However, once I was able to understand the abilities and experience different characters of the game, I felt hooked. All 25 characters, in true Gearbox fashion, are distinctive, well designed and deliver dialogues which are sometimes funny and sometimes just there to fill in the gaps.

Verdict

Battleborn is a game with an identity crisis. It's too loud and over the top, which might not go down well with either the FPS or MOBA community. The gameplay is repetitive, the story missions lack cohesiveness and the multiplayer mode has no team vs team mode. Having said that, the game is a ton of fun, if you are in for a Team Fortress 2 mashing up with Borderlands. Definitely worth checking out. *



INSPIRING
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E3 2016 Highlights

E3 had a LOT to offer this year, it looks like us gamers will go broke at this rate.

E3 had a lot to offer this year. So many titles, so many surprises, so much to look forward to. Ohh the coming years looks good for gamers, we can smell it in the air (figuratively of course). There was so much going on it was hard to select a few good highlights, so we picked many! :D
Let's take a look at the best E3 had to offer this year~

PS4

A new God of War?!

God of War fans rejoice! Or don't, whatever. Sony gave us a whole 10 minutes



of gameplay on their new God of War title and it looks gorgeous. Is it a reboot? Is it a sequel? We don't know.

Death Standing

If you've been wondering what Hideo Kojima has been up to since his departure from Konami, well now you know. And it's got Norman Reedus in it. Looks like Kojima took a page out of Bender's book and made his own game with blackjack, Reedus, and hookers.

Horizon: Zero Dawn

We get to see some more of Horizon: Zero Dawn and its gorgeous open world.



The gameplay showcases some of the features in the game such as dialogue wheels, a crafting system, and mounts.

Crash is Back!

Everyone's favorite bandicoot is making a comeback. Remastered versions of Crash Bandicoot 1, 2, and 3 are coming to PS4. Crash will also be making an appearance in Skylanders Imaginators.

The Future of Star Wars

EA's got several Star Wars games in the works at several studios such as Visceral Games, BioWare, Respawn, and DICE to name a few. We got a glimpse at the latest Star Wars game by Visceral Games, which is still untitled but will feature an "original narrative and new characters".

PC

Dishonored 2

We finally got an extended look at Dishonored 2. We're big fans of the first game and we have big expectations from this one. We got a good look at the landscapes of Karnaca, the place where most of the game is set to take place. We also get a better look at Emily Kaldwin's abilities, who will be a playable character alongside Corvo Attano.



Battlefield 1

EA revealed some sweet sweet gameplay for Battlefield 1 which featured some ground warfare with tanks and stuff, a few dogfights here and there, oh! and a zeppelin being pumped full of bullets and going down in flames.

Quake Champions

The Quake Champions cinematic trailer had us all very excited and reminiscing of our old Quake 3 days. While it maintains its arena-style first-person shooter combat, it looks like there'll be unique characters and abilities as well.

Mass Effect: Andromeda

We finally got some more info about Mass Effect: Andromeda. We got to see a little bit of the game in action with some snippets of gameplay and even a



glimpse at the new Mako! We're also introduced to a few of the new characters.

Watch Dogs 2

Ubisoft also showed off their new Watch Dogs 2 trailer – Hack Everything. We got to see some gameplay and the various approaches and choices a player has when it comes to completing a mission. They also announced that Watch Dogs 2 owners on the PS4 will get their DLC a full 30 days before anyone else. Lucky them.

Halo Wars 2

Halo Wars 2 gets some gameplay footage and a confirmed release date for February next year. They also



announced the Multiplayer Beta with a trailer which of course featured some multiplayer gameplay.

Xbox One

Xbox One Slim

Microsoft confirmed their new Xbox One Slim or Xbox One S at E3. The new console will be priced cheaper and will also be 40% smaller than the Xbox One console. Furthermore the Xbox One S will support 4k gaming with up to six teraflops of performance.

Titanfall 2

Titanfall 2 was all up in our faces at E3. EA have confirmed that Titanfall 2 will indeed have a single-player campaign, something that was direly needed in the first title. They've also improved upon the multiplayer aspect of the game, which was already pretty decent. Furthermore, mechs have personalities now. *Whaat?*



FIFA 17

So FIFA 17 will have a Story Mode. No, not Manager Mode (you'll have that too of course), a Story Mode. And it actually looks good, like really good. Step into the shoes of Alex Hunter as he makes his way to the top of the EPL. However,



story mode will not be available for the Xbox 360 and the PS3, so you better get yourself a current gen console if you want to play Story Mode in FIFA. Yes we realise how absurd that sounds but that's just how it is.

Gears of War 4

We got a look at some Gears of War 4 gameplay which looks like it will be returning to it's roots with old school cover-shooting and some chainsaw action.

Scalebound

Platinum Games' latest at E3 shows us the co-op play in Scalebound with a new gameplay trailer where you work together as a team to take down big ass bosses with your dragons. Sounds like fun!

ReCore

We also got a look at some Recore gameplay in their first ever gameplay trailer. The Xbox One and PC exclusive

title will be launching sometime this September. The tale of the girl and her robot dog looks like an innovative and creative piece of work and we're definitely looking forward to it.

Final Fantasy XV

Square Enix were generous enough to gives us a peek at some Final Fantasy XV gameplay at E3. And wow. The guys at at Square Enix sure do pay attention to detail, it's crazy how good the game looks. We swear if the Square animation team ever decides to make movies, we'd gladly pay to watch those.

Dead Rising 4

We got confirmation about Dead Rising 4, with a new gameplay trailer for the game. We'll be getting Dead Rising 4 for PC as well thanks to the Xbox play anywhere initiative by Microsoft, unlike the previous title which was an exclusive.

Forza Horizon 3

Forza's next title, Forza Horizon 3, has been confirmed as well. And of course it looks gorgeous AF. And what's more, you can now play the game with your friends across Xbox and PC, once again thanks to Xbox play anywhere.

Tekken 7

We see some Tekken 7 action, with Heihachi and Akuma going toe to toe. Tekken 7 will be coming out for both PC and Xbox One early next year. Yep you read that right, for PC as well. And yes, again, Xbox play anywhere. *

And Finally let's not forget Nintendo who showcased their new Legend of Zelda game, Legend of Zelda: Breathe of the Wild alongside an announcement for their newest console, the Nintendo NX. Oh, and incase you missed it, Ubisoft announced that starting June, they'll be giving away a free game every month this year. The occasion of course being their 30th anniversary. Happy 30th Ubisoft! We'll take them free games, thanks.



DRESSED TO THRILL!

PHOTO IMAGING: PETERSON PJ

From Japan to the West and now gathering pace in India, cosplaying is far more than just nerds being nerds

By Manish "Trigger Happy" Rajesh



you're a geek or belong to any kind of geeky fandom, you're probably familiar with or have

heard of the term cosplay. Cosplay first started or originated in Japan, the cosplay culture there is huge and became extremely popular throughout the country come the 90s. Ever since Japanese culture took the world by storm, their music, their anime, their manga, and yes, even their cosplay have become a phenomenon of sorts throughout the world.

Cosplay right now is in a rather unique position. It's something that many look down upon and shun, but at the same time it's something many people love. There's those that live and breathe cosplay and there's those that despise it and think it silly and childish. Then there's also those that accept it for what it is, because whether you like it or not, cosplay is here to stay. It's a fundamental part of every geeky con-

vention, in fact if you aren't wearing some sort of costume at these events, you're probably the one who's in the minority. Cosplay has become a huge subculture in the geek world and is now essentially synonymous with the idea of any gathering of geeks or a geeky convention.

Cosplay is a play on words and is derived from two words – costume and play. Which makes sense because that's pretty much what it is. You play the role of the fictional character you're attempting to portray with your costume. It's a pretty simple concept. You aren't just dressing up as the character, you're becoming the character.

We've got a surprisingly large number of geeks in our country. We've got every kind of geek, from avid comic book readers, to hardcore anime fans, TV show buffs, and even a gaming community that's growing fast. So we're bound to have a few cosplayers as well, right? So we reached out to

some of the best cosplayers in our country to find out more about cosplay and what it entails.

THE ORIGINS

So we asked them why it was that they cosplayed and what was it that inspired them to start. Rhea, one of the cosplayers we got in touch with said that it had always been her dream to "meet a fictional character". Well that's a dream a lot of us shared, we've all wanted to meet Superman or Batman at some point in our lives. Of course it's not limited to just Superman and Batman, it could be Goku from the Dragonball series, or Naruto from.. err Naruto, or Dante from Devil may cry, it could be anyone really, we don't judge. Just like Rhea we've all been through that Peter Parker phase where we've thought up imaginary superhero names for ourself and designed ourselves a neat little costume in our head. We've imagined ourselves with superpowers and what we'd

Tricks of the trade

The SkunkWorks guys specialise in building props, and as you'll soon find out, props are a fundamental part of any cosplay. So if you want to dip your hands into the world of cosplay, you'd better figure out how to make yourself some props and what it'll entail. Scythes Skunkworks were kind enough to give us some pointers in the art of prop building, so pay attention if you're hoping to do some prop building of your own.

Using the Prop - Think ahead, do you think you'll be using it in a crowded place? Or are you maybe using it for a more private event or location which



won't be too crowded. Also keep in mind whether you will be travelling with it over long distances or not (Does it need to be dismantlable?).

Quality of the Prop - The choice of material will greatly affect the life of the prop. So if you spend a little more on better quality, your prop will last longer.

Monies !! - The time, the tools, and the materials, including travelling expenses to acquire those materials, needs to be taken into consideration when planning a budget yourself. You can be creative and save yourself on some spending.



Here are some popular characters being cosplayed by our very talented cosplayers. We have Aorin as Lina, Pracheta as Inu Yasha and Rhea as Killer Frost and Froslass.



do if we ever got those because who knows, there could be a radioactive accident just around the corner and we should be mentally prepared for the aftereffects right? Cosplaying in a way, is literally living the dream for some of these guys. At the core of it all, they do it because they enjoy doing it and have fun when they do it.

For others it's a hobby that lets them explore their creativity. Syrinx and Aorin enjoy the process and work that goes into cosplay as much as the actual cosplaying itself. Cosplaying isn't just simply donning a costume and playing make believe. These guys enjoy the effort that goes into making their outfits and pushing the bounds of their creativity. According to Aorin, "The whole process of creating something and then being someone else is amazing and truly magical".

Pracheta Banerjee feels that a lot of people don't even try. They feel like they can't look like a certain character and

give up even before trying. She takes this as a challenge and her main reason for cosplaying is, "to simply bring out the fact that our looks aren't limited".

As for what inspired them to start, for the guys at Scythes SkunkWorks it came in the form of "a Facebook invite from an old acquaintance, and a newspaper article (divine intervention?) in 2013", which was when they first heard about the Mumbai Film and Comic Convention (MFCC). For others it was something that fascinated them, something that they could enjoy doing with friends, and something that would help them meet new people. And the rest are inspired by their love for the characters that they choose to cosplay. Just enjoying what it is they do and finding inspiration within that.

Cosplaying is a relatively young hobby, with most starting out within the last 5 years. Most of the cosplayers we reached out to had first started cosplaying back in 2011. Back then it didn't have

as much attention as it does now, and now with more and more people being more open to trying new things and welcoming different cultures, surely the number of cosplayers will be on the rise.

While cosplaying itself is a young hobby, the guys who've been doing it since then have been doing it for a long time. What inspires them to continue to pursue this hobby? Pracheta was initially inspired by fashion magazines, and the cosplay featured in them, which keeps her going. The guys at Scythes SkunkWorks say that the hours of time, blood and sweat they put in to prepare and create their costumes and props in order to bring their character to life and do "justice to their heroes", is what keeps them going. Furthermore, they said, "the community, the support and encouragement we get, all of it keep us inspired and motivated to go on." In fact, for most of the cosplayers we asked it's their friends, the community, and their fellow cosplayers who encourage them and inspire them to continue doing what they do. After all, we geeks are a close knit community and we support each other whole-heartedly.

THE FUN

Everyone derives their own kind of fun from cosplaying, it could be something specific, such as wigs, as is the case with Aorin (she's made it very evident that she loves wigs so we had to mention it). Or it could just be the entire process



itself which is fun, which we've mentioned quite a lot throughout this article so far. What the heck once more doesn't hurt and we'll probably mention it again. But nevertheless, we asked the cosplayers what they found was the most fun aspect of cosplaying. The majority said that it was simply the fact that they could be a completely different person, take on the traits of their favorite characters, and transform themselves. The feeling of satisfaction they got from creating their costumes and having it turn out the way they envisioned it was the most fun aspect for the guys from Scythes SkunkWorks. Pracheta got her fun from having people guess the character she was cosplaying as.

Now when one thinks cosplay, our minds immediately shift to all things geek. So naturally we had to ask the cosplayers whether they would still cosplay if they weren't associated with any geekdoms. Aorin says that she's not too sure about that. Her main reason for cosplaying is because she loves the characters, the games, the anime, and the comic books. Similarly even Rhea cannot imagine not being an anime fan or comic book lover. Syrinx says that she probably wouldn't even have been introduced to cosplay if she weren't part of the geek world. However there are some exceptions. Some are simply in awe of the process itself and just enjoy the many aspects of it, such as the photo shoots and the work that goes into costumes, so you don't necessarily need to be familiar with the character to dress up as them. And for others it's simply a hobby to escape from their boring daily schedules.

We asked the cosplayers what kind or type of cosplay they most did. We found that most didn't limit themselves to any particular geekdom. We found a majority cosplayed characters from anime and video games, closely followed by comic book characters. SkunkWorks have a variety of cosplay genre's under their belt, with characters from games, to movies and even cartoons and web series. Cosplay allows you to interpret your favorite character in a way you like best. It allows you to



On the top we have Syrinx and Vijay Singh and below we have the guys from Scythes SkunkWorks strutting their stuff.

add a personal touch to the character. Rhea for example, usually cosplays characters she can connect with. All she needs is to see a very small part of that character in herself to get going.

THE WORKS

In order to cosplay you're going to need an outfit. And an integral part of the cosplaying process is making or preparing your costume. And this is something that all cosplayers agreed upon. Making a costume can be extremely time consuming. Some character designs are, to be frank, downright absurd and it takes a whole lot of props to pull them off. And props are an integral part of most costumes. The time that goes into creating costumes can be anywhere from less than 20 minutes to over a hundred hours. Yes, a hundred. Wow! Just goes

to show you the dedication these guys put into the details for their costumes.

A lot of research goes into building props, the original character, other's interpretation of the character and so on. A lot of time goes into the detailing and accuracy of props, even acquiring the tools needed for the job is an important aspect of the whole process. And of course speaking with your fellow cosplayers also helps, as they're more than willing to share their techniques!

Budget is also an important factor, along with the availability of materials. The amount that is spent on costumes can vary as much as the time taken does. In some cases it could be as little as `250 and in other cases it could be well over `15k. It depends on the complexity of the character you intend to cosplay. You can be smart about it and save up on a lot of money. Additionally, the photo shoots, or hiring a photographer can also be expensive. What you can decipher from this is that cosplaying is not a cheap hobby to have and can take quite a toll on your wallets.

So if you've got the budget, desire, and the determination, naturally the next step is to find a place where you can showcase your cosplay. And there's no shortage of events in the country where you can cosplay to your hearts content. Some of the events held around our country such as the World Cosplay Summit, the MFCC, the Cool Japan Festival, and IGX are great places for you to meet with fellow geeks and literally spread your prop wings.

Famous international cosplayers: Lucia Cosplay, Mon and LALAax, Kamui (Svetlana Quindt), Sosenka, Enji Night, April Gloria, Yüegene Fay, Reika, Eve Beauregard, Leon Chiro, Elffi, Konomi Akira, Miss Hatred, Dustbunny and Alodia.

THE SCENE (IN INDIA)

Cosplaying seems like a fun thing, so we wondered why there wasn't more of it happening around here. We got a mixed response of sorts. Like gaming, cosplay is a growing culture. There's still some taboo in our country over anything geek/nerd related. However, it seems that this hasn't deterred anyone at all. According

Comic Con: Are you part of the revolution?

Not quite in the league of the original fan fest held at San Diego, California, every year, but the Comic Con movement (the largest gathering of fans of comics, games and movies dressed as their beloved characters) has received good support in India over the past couple of years. Comic Con events take place in Delhi, Mumbai, and Bangalore every year, to the best of our knowledge, and we've attended the Delhi and Mumbai editions on more than one occasion.

We had a ton of fun attending the 2015 edition of Comic Con Mumbai, for example, as it saw a good turnout of attendees dressed in a variety of characters (<http://dgit.in/ComicC2015>). Not only was the crowd interesting but also the various booths and guests of honour talking about their love of all things comics, video games and movies. What's interesting to note is that last year's event was definitely better than the year before last, and this is evident at all Comic Con events happening across India.



to Syrinx, "This is a very common misconception. Every year, comic con gathers over 200 cosplayers, each day for 3 days in every city it has an event in. We are definitely not lacking in numbers". Even Pracheta agrees that it's not the numbers that are lacking, but rather the recognition. Cosplay has only recently gained popularity in the country, according to SkunkWorks, and this is only the beginning as it's growing at a rapid rate.

Then why is it that cosplay isn't too mainstream despite the numbers? Awareness is the key. Despite how awfully kung-fu-master cliched that sounds, it's true. There are many people who don't even know what cosplay is or aren't familiar with what it is and what is involved in it. Some suggested more events across the country, and perhaps even broadcasting it for others to see. This way people can even observe the amounts of hard work that goes into the making of these costumes.

Others however believed that cosplay didn't necessarily need to be mainstream to be enjoyable. That's not the primary goal of cos-

player, who at the crux of it all just want to enjoy himself or herself and have a good time. Sure, being acknowledged for it and having more like-minded people is never a bad thing.

So what's the scope for cosplaying in India? Can we do it professionally? Is it a viable full-time job? The short answer, no. The long answer.. is also no. Very few cosplayers actually make a living out cosplaying. And that's around the world. So when it isn't a viable profession worldwide, India has a long ways to go. But you can never tell, times can

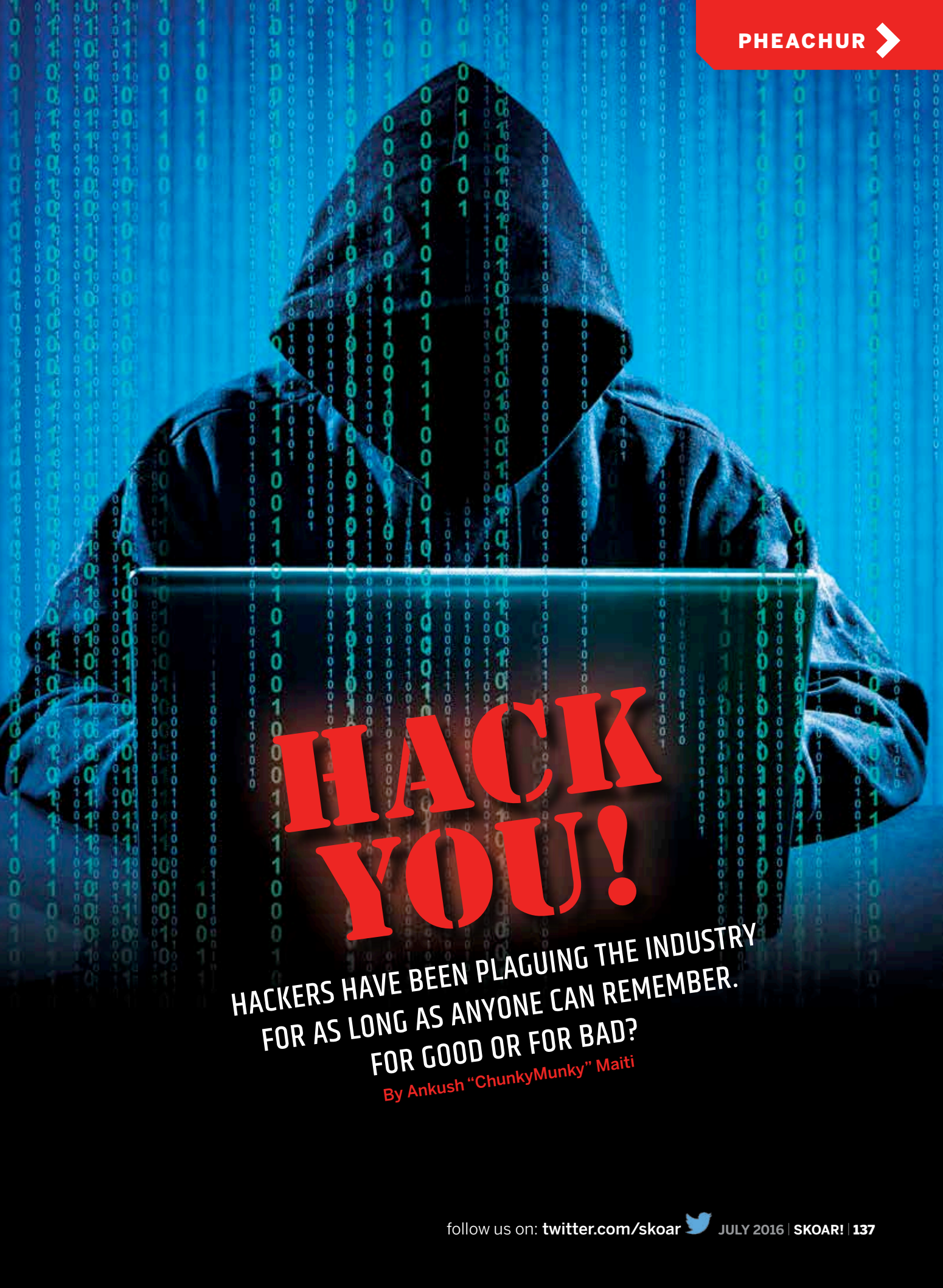


You can never have enough deadpools at any convention

change and maybe it could become a viable profession in the future, but as of right now, it's still just a hobby, and an expensive one at that. However, that doesn't mean that certain aspects of the cosplaying process can't be used to create viable professions. Being able to make your own dresses and props isn't a joke. Also other industries such as fashion and entertainment media will welcome you with open arms.

Lastly we asked if they had any tips for anyone who was maybe inspired by this article to take up cosplaying. And boy did they have a lot to say! The first and foremost thing every one of them had to say was not to be afraid of it. If it's the budget that's intimidating you, there's always cheaper alternatives and if you're creative you can always find a way. Overall it's definitely an expensive hobby to have but there are always workarounds. Don't be afraid to make mistakes, accuracy is not what's important. Don't let anyone tell you who you should or shouldn't have cosplayed as. What's most important is that you have fun doing what you're doing! *





HACK YOU!

HACKERS HAVE BEEN PLAGUING THE INDUSTRY
FOR AS LONG AS ANYONE CAN REMEMBER.
FOR GOOD OR FOR BAD?

By Ankush "ChunkyMunky" Maiti

Ever since video games have been around, people have done everything they can, to get better at them. Many people have put hours, even days, or months, into a game, just to get better at a single game that has taken over their lives on such a level, where they choose to forsake any human interaction, except for the interaction with in game enemies, or teammates, when it comes to online multiplayer games.

Although, not all of us gamers are on the honest to Gabe side of things. Many of us, from the gaming community, decide to switch to the dark side, just to get better at a game. Or at least, look

RISE OF THE HACKER NATION

Ever since computers started getting more secure, people have been trying to look for ways to bypass the various security measures introduced by developers. There is no definite date to when hacking really began, but it's safe to assume that the day computers were invented, people started thinking of ways to take them over.

Hacking in videogames, as well, has no definite timeline. Nobody knows exactly when it started, but it boomed around the '90s, with multiplayer games coming around. People who couldn't get better at a game through practice, went onto the internet, and bought a few hacks from a not-so-legal source, booted up the game, and they were suddenly playing better than professionals, who had been playing the game since it came out.

Hackers haven't just stopped there. Many times, people have been scammed out of their Steam money, or all of their money on their Steam account had been used to buy pointless stuff, and all the goods bought with money were sent to a different account, and from that account, to another, and so on, so that the original recipient could never be traced down.

CRACKDOWN

Once this problem started growing from a few isolated incidents, to a full blown epidemic, developers started stepping in. Obviously, nobody who logs into their game wants their experience, and time to be ruined by some person who has no skill, and is winning solely on the basis of hacks. People started getting ticked off, and complaints about rampant hacking started flooding in, and that's when devel-



better. People resort to downloading a few hacks from the shady part of the internet, and boot into a game, run their hacks, and ruin the game for their teammates, as well as their opponents, for the amount of time they're in the game, just to make themselves look better, and rank themselves, or their friends up.

The weird thing is, people who buy these hacks don't realise that the people who make these hacks are actual hackers, who make hacks for a living, and that the hacks are not only limited to innocent videogame hacks and mods. These hackers are also in the business of making much more malicious programs. The kind which ruin people's lives, and start wars and stuff. No biggie.

It started off small. Simple DDOS hacks, which just lagged the entire server, making it impossible for anyone else to play, while our not-so-beloved hacker racked up kills, by killing immobile, helpless opponents. To the other players on the server, the hacker in question appeared to be teleporting around, or whooshing around the entire map, while they just stared at him, speechless.

As of today, there are many hacks, in various games. First Person Shooters are the worst hit, with Aimbots, Wall hacks, silent aims, spin bots, the list goes on. Even in MOBAs, there are many hacks. Hacks which reduce the cooldowns of certain spells, or eliminate it altogether. Or map hacks, which provide vision of the entire map to our friendly neighbourhood hacker.

opers treated it as a serious problem that needed to be looked into.

To try and limit this cheating epidemic, developers set up many softwares which detected hacks, when anyone used it on a secured server. In Valve games, one of the methods used, to curb cheating is VAC (Valve Anti-Cheat). Games like Team Fortress 2, DOTA 2, Counter Strike: Global Offensive use this to identify, and permanently ban hackers from playing the game on VAC secured servers.

Another popular FPS, Call of Duty, enforced their Anti-Cheat technology under the name "Punkbuster". It does exactly what it says on the cover; busts li'l punks who think they can hack around, and win games, and ruin everybody else's experience.



Although, these aren't very effective, because hackers always find new ways to bypass all of that. They just tweak their hacks a bit, and make it undetectable to the new standard, and voila, their hacks are good to go, for a few months, at least.

Valve got scent of this, a year or so ago, and introduced a new way of convicting hackers in Counter Strike: Global Offensive. They rolled out Overwatch. Now, Overwatch takes help of the community, something which Valve is famous for doing. What it does is, whenever someone is reported for cheating in a competitive match of CS:GO, Valve sends a video of the match, from the perspective of the suspected hacker to someone on the Overwatch community, which consists of experienced players, and professionals. The Overwatch community then reviews the video, and decides whether or not the suspect had an unfair advantage over the opposition, or if the suspect was just a very good player. It's more effective than VAC, because player perspective would give away undetectable hacks very easily.

Some developers went and even decided to have fun with some of these hackers. Rockstar games decided to give hackers a taste of their own medicine. If you were convicted of cheating on Max Payne 3 multiplayer server, your account would be blacklisted, and you'd only be allowed to be matched up with other convicted hackers, in a "cheaters pool" of sorts. Now, hacking against other hackers is kind of pointless. So, you're constantly stuck in a loop of never dying, even though you're hit by a million rockets, and other people who never died either, and had unlimited ammo, and no reload hacks. If you were nice enough to apologize to Rockstar, they'd allow you to be pulled out of the cheater's pool. Although, if you were convicted of hacking again, you'd be permanently banned.

AFTERMATH

If you were wondering what it's like, getting banned, look no further. Well, mostly because nothing much happens. Your copy of the game becomes obsolete, and you're only



allowed to play if you buy another copy of the game. Or in case of Steam, only if you buy it from a different account.

As of today, there isn't much to deter hackers from hacking, at all. Permanent bans are easily bypassable, if you buy another copy of the game.

Getting a VAC ban is the gaming equivalent of being thrown into Davey Jones' locker. Only, it's easy to buy your way out of it, if you just buy another copy of the game.

The gaming community, at large, has been baying for blood, about how easy it is, for a hacker to return to a game. If they're banned on one copy of the game, or on one account, they could just easily make another account, or buy another copy of the game, and they're back. There's many theories explaining exactly why many developers won't introduce a permanent way of making sure hackers stay out of a game, or at least make sure that it isn't easy for them to return to a game in which they've been convicted of hacking. One of the major speculations being, developers do it to keep up their sales. A hacker who has been convicted is

forced to buy another account, and another copy of the game, which ensures that the sales of the game don't stop. It's backed by the fact that after a massive VAC ban wave, in 2014, CS:GO sales rocketed. Which meant that all the hackers that got banned, just went and bought another copy of the game.

Personally, we, at Skoar, really liked the community run servers in CS 1.6, where the Admin would take prompt action against suspected hackers, and kick them from the server. In games like CS:GO, you'd have to play an entire match, even if the hacker is up to his mischief since round one, lest you get a matchmaking cooldown.

WHY YOU SHOULDN'T BE HACKING

Well, if you've ever played against a hacker, you'd know. But just to drive the point home, it ruins everyone else's game as well. You're fuelling potentially criminal hackers, who wouldn't think twice before wiping your bank balance clean, if they thought they could get away with it. You're also turning away millions of people away from playing competitively, and finally, you're a massive, massive butt, if you hack or cheat. *

Community

Find all sorts of contributions from our community and constructive arguments from our forums

**The Rock on YouTube**

The Rock is now on YouTube, and he's made a movie trailer to announce it <http://dgit.in/TRockYT>

Back to School Jugaad

We're an ingenious nation. The term "where there's a will, there's a way" probably originated here. If you don't believe us, take a gander at these...

**For your noodle needs**

Instant food is a staple in the diets of almost every college goer and hostel dweller. It's like magic food, pop it into hot water and voilà! Edible food! But without a gas stove or a microwave where are we going to get ourselves hot water? Well, this is one way you could go about it...

Shower in style

Your bathroom missing a shower faucet? Difficult taking a bath with one single stream of water pounding away on your head? Fear not, with this simple trick you can now bathe in style. Okay maybe it's not thaaat stylish but it works so who cares. Right? Function over form we always say.

**Mirror mirror on the wall**

Or rather, the lack of a mirror on the wall. We understand, mirrors can be expensive. Just get yourself a laptop to fulfil your mirroring needs. A laptop comes with some mundane added benefits as well, such as internet browsing and being able to listen to music.

**Tangle free**

We've all been there, scrambling for the nearest socket to charge our phones or laptops or whatever gadget it is we have that needs charging. And in most hostels there's a shortage of sockets as well, so it's first come first serve. Or you could be smart and use something as simple as a hanger to create a tangle free portable extension for yourself and your buddies.

Who Needs A Spoon Anyway

Ever been in a situation where you needed a spoon but all you had was a fork? Well, to be completely honest we haven't either, but these guys clearly did. But they were also smart enough to come up with a neat workaround. Jugaad to the rescue!

**No Fridge? No Problem**

Have an AC but for some reason can't afford a refrigerator? Or maybe your accommodation comes with an AC but no fridge? Fear not, with this simple technique you can ensure your water and beverages are always chilled. Well, maybe not chilled but cold enough. And in the hot summer months that's all you need.



Don't be a killer

You can play and finish all of Watch Dogs 2 without having to kill anyone
<http://dgit.in/WDog2>



Age old farmers

Turns out we weren't the first farmers, it was termites, 25 million years ago
<http://dgit.in/TrmtFrm>

Unwind

How we unwind



Con-fury

Everybody in office took a crack at the PS4, playing SF-V and Homefront and puking later on at the horrible gameplay. This was in part due our incompatibility with controllers; we just can't get our heads around how you guys aim with this thing. Give us a keyboard and mouse any day.

Geek romance

Sid is trying to expand his romantic horizons beyond Tinder this month by actually trying to understand how technology has changed the human courtship ritual. This book by Aziz Ansari examines precisely this subject area and it quite nicely written. We're not very sure Sid needs any help on this front though.



Facebook feuds

A lot of time was spent observing and sometimes participating in ongoing feuds on social media. Posts on Trump, feminism, atheism, and every other ism we can think of. And while most of us wouldn't really last in an actual fight, we're pretty sure we can hold our own when it comes to wordplay.

digit DIARY

This month began with everyone going abroad. Well, almost everyone. Siddharth and Jayesh headed off to the States. Abhijit went to Taiwan, and Mithun went to Macau. Nikhil also decided he needed a vacation and headed off to North India with family. Even Arnab wasn't around during the start of the month, having just recovered from dengue he was at his hometown in 'Khadakpur'. What this means is that there was little to no supervision for half the month. And no supervision means more slacking off, which is exactly what ended up happening. That is till Jayesh and Siddharth came back bearing gifts. And by gifts we mean chocolates. So the trip wasn't a complete waste after all. However, along with them also came the realisation of looming deadlines and the daunting task ahead of us.

But it seems our already tight deadlines would only get tighter, as everybody decided this was the right time to fall sick. First our intern Ankush fell victim to the sickness. He didn't show up for an entire week citing "viral fever" as his reason, but we're suspicious of anything he says after his shenanigans last month. Jayesh was next to fall and was quickly followed by Siddharth who joined them in the sick bay. Things were not looking up, but as closing crept ever closer everyone pulled themselves together for a final do or die effort to the finish line.

While Jayesh was still down, we decided to take a break from Counter Strike and brought out Warcraft 3 for some good old

real-time strategy fun. Arnab definitely seemed to be more into this than Counter Strike and managed himself pretty well despite it being his first time. He even managed to beat Abhijit the second time around, who supposedly already knew how to play the game, but we have our doubts now. Siddharth on the other hand, despite all his bragging managed to have his ass handed to him twice by Manish (the prodigal son who returned).

Of course this was only a short break and once Jayesh was back, we were back to playing Counter Strike in no time. In fact, one could say we came back with a bang and even clinched a 16-0 win. Not meaning to brag or anything but that's a big deal. Just kidding, totally meant to brag about that. We've all been bitten by the competitive bug and have been working on upping our games. And while some of us have been advancing up the ranks

pretty fast, some of us *cough*Mithun*cough* haven't advanced too much. And yes, despite our deadlines creeping up on us and the delay thanks to all the slacking off, we still somehow always manage to make some time for a round or two.

In other news, we thought Arnab had found himself a new flame, or rather many new flames. He'd get up and leave often, and someone even swore they heard him talking to himself at some point. After further investigating it turns out that the "flames" were just Siri and Cortana and he was just working on an article. Oh well.





LoL buys CoC

Tencent, buys Supercell, the company that made Clash of Clans.
<http://dgit.in/LoLxCoC>



Crops on Mars?

Crops grown on Mars are safe to eat, says a simulation conducted by a team of scientists. <http://dgit.in/marscrops>



Every month we recognise the best contributions by our community members and publish it here. Keep up the good work, Digitians!

Community Creations

Head over to forum.digit.in, for some of best discussions, buying advice, and user reviews. Of course, you will meet like-minded (and not so like-minded) geeks, leading to some of the most constructive arguments you'll ever have.

Check out the thread below. E3 2016 saw a smorgasbord of video game title announcements from studios and publishers, one of them including a new Quake game called Quake Champions. Already popular among us and our community as well, the members took to the forums where we witnessed a healthy discussion (or maybe otherwise) between FPS and MOBA games. To read the entire thread, follow the link: <http://dgit.in/qcdf2016>

13-06-2016, 09:37 AM #1

alienempire

Federal Agent Area 51

Join Date: Sep 2012
 Location: കേരളം (Kerala), ഇന്ത്യ (India)
 Posts: 1,194
 Post Thanks / Like

Quake Champions

Quake. Is. Back.

The fast, skill-based arena-style competition that turned the original Quake games into multiplayer legends is making a triumphant return with Quake Champions. Running at an impressive 120hz with unlocked framerates, id Software's new multiplayer shooter is getting ready to take PC gaming by storm once more.

Quake Champions features a roster of unique characters, each with their own distinctive abilities, allowing you to fight the way you want. . Get your first look at Quake Champions and some of its heroes in the cinematic reveal trailer, debuted during the #BE3 2016 Showcase.

To stay up to date with all the latest information on Quake Champions, head to Quake.com.

Reply With Quote

13-06-2016, 10:14 PM #3

Nerevarine

Human Spambot

Join Date: Feb 2011
 Location: Bhubaneswar
 Posts: 5,056
 Post Thanks / Like

Re: Quake Champions

Age of Mobas is over, I guess the age of fast paced FPSes have begun (Overwatch, Battleborn, this, Unreal Tournament)

This is class based game like Overwatch, battleborn.. Sad I thought UT actually had competition :/

Reply With Quote

16-06-2016, 11:36 PM #6

Desmond David

Disposable Hero

Join Date: Apr 2005
 Location: Pune
 Posts: 4,798
 Post Thanks / Like

Re: Quake Champions

Doom's multiplayer was developed by Certain Affinity, not ID. Certain Affinity are known for developing Halo multiplayers. That is why Doom's multiplayer bears a similarity to Halo in many regards.

I hope that Quake Champions is as fast paced as the original Quake 3 though and they might do it that way as well. Quake Live still have many players and they might move to QC too.

There are speculations that Quake Champions might be free to play like Quake Live.

Reply With Quote



Xiaomi Redmi 3S

Xiaomi has unveiled an updated version of the Redmi 3 with a fingerprint reader.
<http://dgit.in/RedMi3s>



Apple File System

Apple has a new uniform file system for its called 'Apple File System'.
<http://dgit.in/AFsystem>

Digit Squad



Here are a few images sent by Digit reader Suvhradip Ghosh who loves to capture his journey. If you want to be featured here, send us your images at community@dgit.in

Did you know we are on Instagram too?
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सुरक्षा

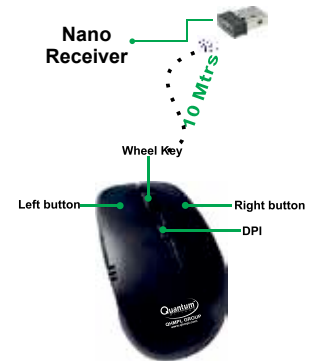


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Available in Best Colors :

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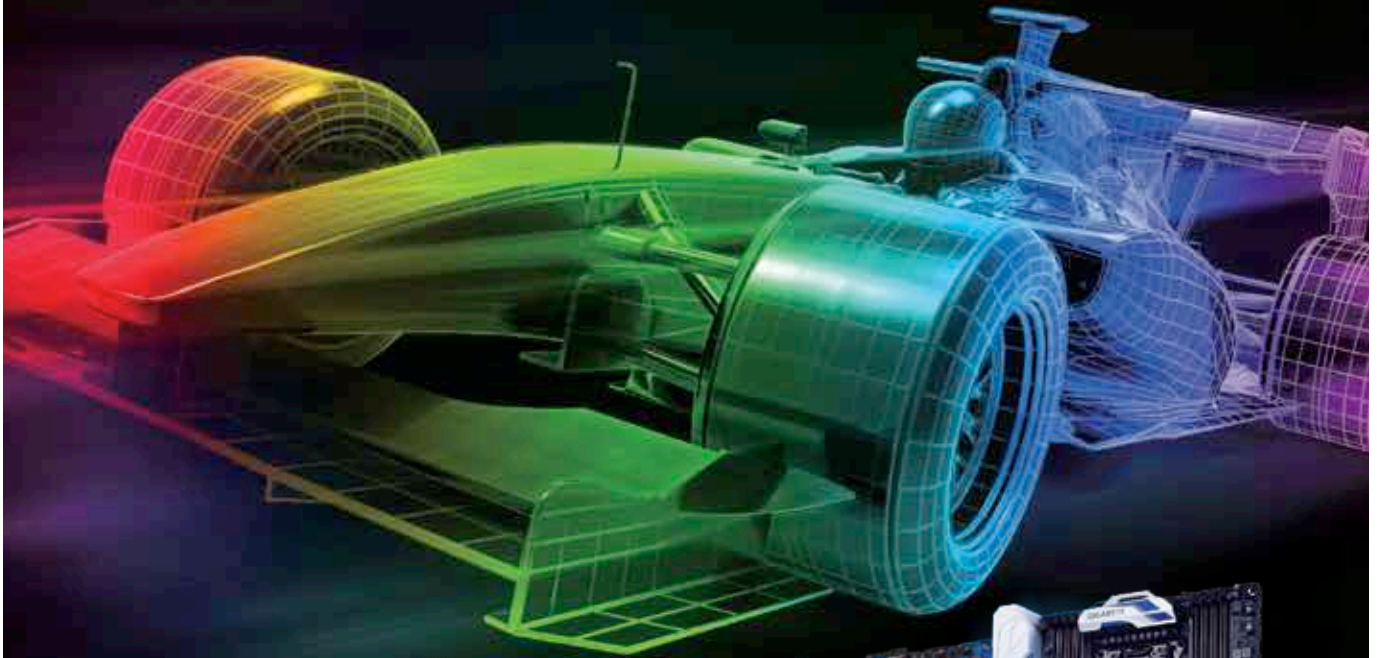


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