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## THE MEME ISSUE

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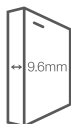
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# We don't usually do memes, but when we do...

All right we can't resist anymore. The meme-force is just too strong. We have finally given in and decided to appease our millennial overlords by having memes in the magazine. Heck, we've dedicated this entire issue to memes!

Memes are more interesting than you'd think. Without spoiling anything in the cover story, I can tell you that they are more than just the images that you see widely circulated online. Memes as a concept was first thought of to be analogous to genes – the fundamental replicators responsible for evolution of life on earth. Memes can be loosely thought of as cultural units of transmission. They survive. They adapt. And they evolve.

Speaking of adaptation and evolution, Digit too has evolved a lot since its inception. We've gone through two major redesigns, gone from CDs to two dual-layer DVDs, then back to one, started a lifestyle section called dgt, introduced tons of new booklets like dmystify, Encyclopedia Technica, and so many more that I'm probably forgetting...

However, despite all these major and incremental changes, the next evolutionary leap – transitioning the mag to the digital realm – hadn't been made. The need had been apparent to us longer than you'd think, but just like genes need a favourable environment to thrive, the mag too needed environmental factors to match.

We've been watching the digital publishing space for a while now, but there always seemed to be some hiccup or the other. If the platform was good, the price was prohibitive, or if the solution was affordable, it was nothing more than a glorified RSS reader, or worse, merely a PDF file to be viewed on a screen. Digit was available on Magzter and Read-Where in those formats, but they were pretty lame, to be honest. Heck people actually did some creative coding to find workarounds for the security of one of those sites, and before you knew it,



**Siddharth Parwatay**  
Managing Editor

## **"Despite incremental changes, the next evolutionary leap for the mag hadn't been made"**

Digit PDFs were being distributed on P2P networks.

We didn't really care too much to be honest, because reading a magazine in PDF on a phone is such a pain that if someone was willing to undergo all that torture, we figured they had earned the right to read it.

Then there was the problem of which platform to design for. About 3 or 4 years ago we wasted a good 6 months designing our magazine for tablets, knowing fully well that tablets would never be mass. This was because mobile screen sizes and resolutions were still playing catch up. To date, Wired and the like are available only on tablets. We wanted to be available on your primary device... your smartphone. So we had to wait. However, technology really wasn't the biggest problem though, because we're usually on top of such things.

The bigger factor that made us wait until 2017 to properly launch the app (which might seem shocking to most), is that you guys just weren't willing to pay for content in anything but the offline / print form. When I say you guys, I mean

the Indian technology reader in general, not specifically the print readers. Till about mid-July last year, just about 3.1 per cent of mobile app users in India were spending money on in-app purchases compared to 5.2 per cent globally. But the good news was that the trend was on an upward swing.

A kick in the pants for all of us was the demonetisation drive. Regardless of your views about it, you can't argue with the fact that it did force a lot of people to use digital payments and get used to using their smartphones for something other than clicking pictures, chatting and using social media.

Despite it being 2017 already, we're still probably one of the very first tech publications in the world to have an app to read a print magazine on a smartphone. Heck, there are not too many magazines that will offer you the readability that we are, and the time is now right.

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# The selfish meme



Note: There is a book by the same name as this column. My apologies to the author for cheapening it with bad memes.

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MARCH 2017

VOLUME 17 \ ISSUE 03

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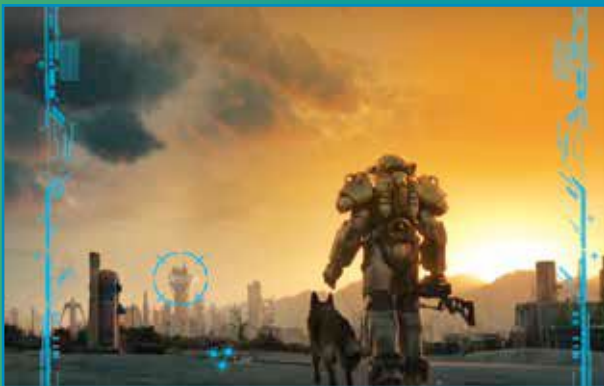


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We take you back to the very beginnings of the beloved open world gaming genre

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- SuperAntiSpyware
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Things in our universe can be unimaginably large and small. In this video series, we'll try to imagine the unimaginable!

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- Scale of the galaxy
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 WD Green SSD 240 GB  
 ASUS ZenFone 3S Max  
 MSI GE62 7RE Apache Pro  
 OWC Mercury Electra 6G MAX 1.92 TB SSD  
 ZTE Blade A2 Plus  
 Seagate IronWolf 10 TB NAS Drive  
 SteelSeries Apex M800  
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 Vivo V5 Plus  
 GIGABYTE AORUS GA-Z270X-Gaming 7  
 ASUS ROG GX700  
 Cooler Master Devastator II Combo  
 Coolpad Note 3S

### Comparison Test

Xiaomi Redmi Note 4  
 Lenovo K6 Note  
 Honor 6X  
 ASUS ZenFone 3S Max  
 ZTE Blade A2 Plus  
 Xiaomi Mi Max  
 Lenovo P2  
 Lenovo Z2 Plus  
 Coolpad Cool 1  
 Moto G4 Plus  
 ASUS ZenFone 3 Laser  
 LeEco Le 2  
 ZTE Nubia N1  
 Lenovo Phab 2 Plus  
 ZTE Nubia Z11 Mini

Published and printed by Kanak Ghosh for and on behalf of the owners, M/s Nine Dot Nine Mediaworx Pvt Ltd.  
 Published at A-262, 2nd Floor, Defence colony, New Delhi-110024 and printed at International Print-O-Pac Limited,  
 C/4-11, Hosiery Complex, Phase II Extension, Noida-201306 (U.P.) INDIA. Editor : Kanak Ghosh.

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| 1   | Place of publication  | Nine Dot Nine Mediaworx Pvt. Ltd., 121, Patparganj, Mayur Vihar Ph. I, Near Mandir Masjid, Delhi-110091.  |
| 2   | Periodicity of its publication  | Monthly   |
| 3   | Printer's name<br>Nationality<br>(a) Whether citizen of India<br>(b) If a foreigner, the country of origin<br>Address   | Kanak Ghosh<br>Indian<br>Yes<br>N/A<br>BH-44, Sector-II, Salt Lake, Kolkata-700091  |
| 4   | Publisher's name<br>Nationality<br>(a) Whether citizen of India<br>(b) If a foreigner, the country of origin<br>Address   | Kanak Ghosh<br>Indian<br>Yes<br>N/A<br>BH-44, Sector-II, Salt Lake, Kolkata-700091  |
| 5   | Editor's name<br>Nationality<br>(a) Whether citizen of India<br>(b) If a foreigner, the country of origin<br>Address  | Kanak Ghosh<br>Indian<br>Yes<br>N/A<br>BH-44, Sector-II, Salt Lake, Kolkata-700091  |
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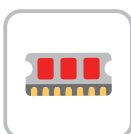
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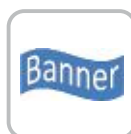
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**Galaxy Book tablet**

A new "Book Setting" app for Windows was teased by Samsung on a new Win 10 tablet. <http://dgit.in/TabPro10>

✉ I've been meaning to write a letter to you for a long time but somehow never got around to it. But finally I'm doing it now. I wanted this letter to be featured as the 'Letter of the Month' so I went back to my collection and read through all the previous letters in the Inbox section, and found that the letters in which the writers expressed their true opinion are selected as the "Letter of the Month". So that's what I'm going to do.

First of all, I want to say a big thank you to Digit and the team behind it. I am now in the 10th standard and as you would expect, I am totally grounded by my parents. In fact, I even had to take permission from them to use the laptop to write this letter to you. So my only source of technical information, as well as entertainment, is Digit.

I started reading Digit from April 2014. My birthday was on the 11th of April and I got some cash, so when I went into a shop and saw the copy of Digit I was amazed by its contents so I went ahead and bought it and from then till now I have got myself every issue of Digit without fail.

I have collected everything from the FastTracks, dmystifys to the packaging material. I just love every part of Digit. I was Inspired by this month's Fast-Track on 'How to become a successful Youtuber' and I have decided to create a channel on 'Applying Technology in Daily Life' after my board exams.

This vacation I will be visiting three countries – Singapore, Malaysia, and Thailand. I wanted to ask whether there is any advantage in buying electronics there? If yes then from which of the three countries and from where?

I am also looking forward to build a desktop (+1 for the PC Master Race).

Here are some suggestions I would want to see in Digit:

1. A cover story on the evolution of education would be great.
2. I would love to see a FastTrack on multimedia software. Speaking of the DVD UI, I just love it (pun intended).
3. Finally, could you mention the 'Most Admired Gadget of the Month' in the Digit Diary?

## Feedback for the February 2017 issue of Digit



Hope I have put my letter writing skills which I have learned in my school life to good use.

–Monish Meher

Hey Monish, nice to hear from you and thank you for all your love and support. If you are purchasing electronics be aware that some product categories carry heavy import duties for example large screen LCD TVs. Hardware in Singapore might carry discounts so it'll be worth checking out especially since you are planning to build yourself a rig.

Thanks for your suggestions, we'll look into them.

–Siddharth

Hi, you call yourselves the PC Master Race. For me, PC gamers are just crybabies. People still think "Why buy a system just to play games?" The answer is simple because we are better.

Do you PC gamers know the feeling of being completely immersed into a game? Not only watch the game but feel the game? Do you PC gamers ever wonder why we spend thousands of dollars on consoles? Because we live in the world. We've walked the worlds more freely than you PC gamers could ever imagine! And we will not stop until the console war is won!

Hail consoles.

P.S. Also during multiplayer, you actually have something to throw at people over mice.

–Kami Lucky

Hello Kami. Without mincing words, let's just say PC Master Race rules.

Jokes apart, we are already witnessing a convergence in terms of graphics capability between console and PC games (x86 for the win). This month's FT is specially dedicated to you.

All hail Lord Gaben!

–Abhijit

Hello Digit, to start off, thank you. I have completed the renewal and many thanks for the promo code.

However please note the following problems and take it up with your IT/technical team urgently.

1. Using subscriber code for renewal does not help. All info such as name, address etc., (mandatory fields) have to be re-entered again! If you were looking to make the renewal process easier adding subscriber ID is just one more field to the whole list and it just added to the data entry burden. Please look into it.
2. On completion of payment, we get an error page not found. This is





## Skin vs. Brain cancer

According to a new study, human skins can be morphed into genetically modified, cancer-killing brain stem cells. <http://dgit.in/SkinBrain>



## Lenses for robots

A new type of 3D-printed lens created by researchers from the University of Stuttgart can help robots see like eagles. <http://dgit.in/RobotLense>

**Inbox**

the second time I have seen this. It causes instant panic as one thinks of issues such as fake website. The issue may be because of the code interlinking between you and CC Avenue. Luckily, I know an email follows from CC Avenue but others may panic. (does anyone at Digit not test your production site for the renewal/subscription process?)

3. The email from CC Avenue contains everything except subscriber code for the renewal. Check your form submission code with CC Avenue.
4. The validate promo code button does not work on Chrome browser on a Windows PC.
5. The subscribe option on your home page does nothing on Internet Explorer.

My young kid and I love Digit magazine – truly madly, deeply. But I thought you should know of all the

website issues mentioned above that doesn't look good on a technology magazine of your stature.

Please consider feedback as a well-wisher. All at Digit, hatsoff for super content. Keep 'em coming!

Warm Regards.

–Narasimhan Jais

Dear Narasimhan, please accept my apologies for the trouble that you faced during your renewal. Rest assured our IT team is looking into the issues that you mentioned. We appreciate you taking the time out and alerting us about these issues. Would you be kind enough to try out eMag app as well? We would greatly appreciate your feedback on that platform as well. Thank you.

–Siddharth

While scanning the contents of the DVD with Clamav, a virus called "Win.

adware.Opencandy-6" was reported by the antivirus in the Frostwire executable file under Essentials. Is the executable really infected?

–M Kumar

Hello M Kumar, certain freeware software come bundled with third-party software and sometimes they are flagged as a virus. The best practice is to select custom installation without skipping so that it doesn't force you to install an unwanted bundled software. In other words, click that "Next" button very carefully.

Unfortunately, we haven't been able to detect anything on our side and we hope your system wasn't infected. In case there's an infection, you'll find Malwarebytes in the same folder of essentials. Install and run a full system scan.

–Abijit

## LETTER OF THE MONTH

Since a long time Digit has consistently provided a Killer Rigs section, issue after issue, where anything other than Basic Computing (Basic Rig) equates to Gaming! With aliases like entry-level, mid-range, high-end and ultra high-end gaming! The only other variant remaining is the Test Rig.

Now, does Digit consider high end CAD, video/image editing, animation etc. as serious computing other than basic computing, gaming and testing?

Till date I have not come across a single issue that features a build for high-end CAD, FEA, CGI or other scientific applications that demand strong and advanced computer hardware.

Please think about dedicating some coverage towards them in detail for builds running programs like, say, Revit MEP, Navisworks, Autocad Plant 3D, Smartplant 3D etc.

You should also think about a section talking about in-depth tutorials to use generic and free engineering and scientific software dealing with, say, pipe stress analysis, finite element analysis, fluid flow analysis, reverse engineering so on and so forth.

I feel some of our Digit Gurus are somehow obsessed with gaming. To the clan of programmers delivering state of the art, spectacular games that churn good turnover for many enterprises – I am sorry to say this industry is still mostly obsessed with design of games that depict and glorify sword-wielding, gun totting and bloodshed by brute power. I don't understand why many sensible Indians go gaga and show their obsessive conviction to such things.

Alternatively, Digit may glorify DIY or Make In India initiatives that may lead to self-employment, income generation to the poor and women empowerment.

I hold Digit's endeavour with very high esteem towards creating awareness and tech savviness among people of all ages and gender. Hence I do believe Digit will present with better responsibility toward the nation in years to come. I believe in Digit.

–Amitava Sil



First of all a big thank you from me and the entire team for your support and kind words. Your feedback is very valid. In fact, you'll be happy to see that this month's Killer Rigs section features a Graphics Design / CAD oriented configuration. A section which talks about things like parametric 3D modeling or how to use would engineering oriented tools would also work as a one off. We'll definitely look into it in our upcoming issues.

The only point where we largely disagree is your perception of gaming. Sure, we're obsessed but the games themselves aren't only about gore and violence. In fact many games these days are all about making the player really think hard to come up with creative out-of-the-box solutions rather than the all guns blazing approach that you describe. We like your suggestion on focussing on DIY and domestic achievements. Be sure to check out Space Age this time. Thanks once again.

–Siddharth

## > GREED

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

**THIS MONTH:** 2018 Ford Mustang, Vertu Constellation, Iron Man Mark 43, Mahersoft INDIE 3D printer, Oral-B Pro 2000 and 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:** All Our Gods Have Abandoned Us, The Selfish Gene, and upcoming stuff to watch out for in February 2017 ...

## DESIRE > SHOWCASE

# Smart Spectacles



## Bat Bot B2

Professor Soon-Jo Chung of the California Institute of Technology, along with a team of engineers from Caltech and the University of Illinois, have created a robot that closely mimics the complex flight of bats. This 'Bat Bat', as they call it, isn't remote controlled, but is entirely autonomous. It's been made using silicone wings, 3D-printed joints and carbon-fibre bones. This little robot mimics the manoeuvres of a bat amazingly, and it does so silently and unobtrusively, just like, well, a bat.

The University of Utah has come up with a pair of smart glasses that may eliminate the need for bifocals in the future. These smart glasses make use of liquid lenses that automatically adjust their focus. This means that you don't have to keep taking your glasses on and off or switching them for reading glasses etc. Carlos Mastrangelo – the professor who led the research on the

glasses alongside doctoral student Nazmul Hasan – said that any person who puts these glasses on will see objects in front of them clearly, no matter the distance. As people get older, their vision tends to weaken or get poorer. This is due to the eye lens' being unable to change shape as required. This is the reason most people tend to need reading glasses or bifocals as they get older. Prescription

glasses today simply change the range your eyes can focus on; you can see closer, but you need to take your glasses off to see farther away. With these smart spectacles your eyes will actually be able to adjust to different distances. Of course, no smart object is complete without an app. The smart glasses come with an app, which lets you calibrate the lenses and update your prescription as needed.

## Aerix Black Talon 2.0



The beginner friendly micro

first-person view racing drone comes with an altitude hold feature which eliminates the constant need to manually maintain height.

## ONEMicro Surround



These wireless surround

speakers support 5.1DTS/ Dolby, CAS, and DLNA/ Airplay, 360 degrees of surround sound with 20 hours of playtime.

## Jack



If you wanted your audio devices to have Bluetooth

capabilities, this is exactly what you need. It can also sync to your friend's audio device so that you both can listen to the same music.

## Herbert



Now you can grow your vegetables in-doors in a

simple, clean and efficient manner with this hydroponic vertical farm. It's leakproof and looks picturesque enough to hang on a wall.



DESIRE

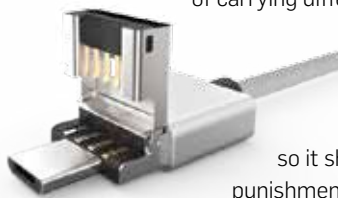
# TAKE MY MONEY!

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

## Trilobi

**T**rilobi is a 3-in-1 common Tip MAG cable which works with all devices. Doesn't matter if you're using an iPhone or an Android phone, or any kind of tablet, Trilobi will work with it. It also supports phone to phone charging. When we say 3-in-1, we mean that it functions as a lightning connector, a microUSB and a good old USB-A connector. Trilobi solves the problem of carrying different cables around, quite common in households using different kinds of devices. The cable itself is made of a durable nylon, so it should be able to take some punishment. On one end of the Trilobi we have a lightning and Android connector.

One side functions as a lightning connector, and when switched around, it's now an Android connector. On the other end, you have a USB-A and microUSB connector. The USB-A transforms into a microUSB by opening up.



## NOLO VR

**N**OLO is a front-facing room scale motion tracking system that works with mobile devices and with Steam VR games. The best part? It's quite affordable. NOLO VR comes with a headset for your smartphone, controllers and a base station

to register your motion. Unlike high-end VR headsets like the HTC Vive or the Oculus Rift, you will watch everything on your smartphone display. However, at \$99 (₹6,500 approx.), it's a considerably cheaper option. Some of NOLO's features include six DoF (Degree of Freedom), four hours of battery life and compatibility with most Android smartphones and VR headsets. SteamVR shouldn't have too many issues with Android but since many developer functions are limited in iOS, there might be a few problems.



## Pixlplay

**P**ixlplay can turn your Android or iOS device into a camera. A camera specifically designed for kids to have fun with. The camera design is inspired by the classic 35mm cameras from back when people actually carried cameras around. Pixlplay is rugged by design, so that your phone isn't damaged with rough usage. To get it working, first open it up, for this you need to unlatch the two child resistant latches. Then you plug in Pixlplay's audio jack. This controls the shutter button on the Pixlplay. You'll of course, need a lightning to 3.5mm adapter for the iPhone 7. Next, simply insert your smartphone into Pixlplay. There's an adjustable clamp which allows for a wide selection of phones to be able to work with the Pixlplay. While you can continue to use your phone as you normally would, simply close Pixlplay's door, latch it up, and now it's kid-proof and good for a round or two of old school photography.



## PlezmO

**P**arents want to introduce their kids to the joys of programming as soon as possible and gadgets are more than welcome to help. That's where PlezmO comes in. PlezmO has been designed to be easy-to-use right out of the box. This is because PlezmO's apps walk you through the steps you'll need to take, along with examples, to make it as easy to use as possible. Everything has been designed to help whoever is using it understand how the program works and how to use. This means you don't need any prior knowledge in coding to get started! PlezmO makes use of many sensors, or elements as they call it. Some of the features available in PlezmO elements include a buzzer, a proximity sensor, light sensor, motion sensor, a display element, button and more. You can program the PlezmO elements wirelessly using PlezmO apps.

## Versatyl

Versatyl is a travel jacket whose goal is make sure you have pocket for everything you'll need for when you travel. Versatyl comes with a total of 18 pockets, and it's made of 100% polyester, i.e, it's water resistant. It also comes with a detachable hood, loops for your headphones, a pen holder, and



a pocket for just about anything you could think of carrying along with you. At the back of the jacket, you have a "carry all" pocket. While not in use it's folded up, and when you need even more room to carry stuff, you can take the satchel out and use it as a sling pouch. Other features include retractable

gloves, reflector strips, wrinkle-free fabric etc; this is the go-to jacket for travelers. Versatyl is available in four color options, Ebony Black & Grey, Electric Blue & Black, Cool Blue & Dark Blue, and Fiery Red & Black. It's currently live on Fueladream.com, look for Versatyl and grab your own for just ₹1,999 while it still lasts.

## Stark

The smartwatch trend is quickly catching up. The only thing stopping most people from picking one up, is the price. Stark is a hybrid smartwatch with all the functionalities you'd expect from a smartwatch. Also, at just \$40 (₹2,700 approx.), it's extremely affordable as well. Stark's activity tracker can track your steps, distance travelled, you can set goals for yourself, record your exercise sessions, track calories burned and more. Stark's case is made out of stainless steel, its hands are glow-in-the-dark, and the strap is made out of a thermoplastic polyurethane. Stark is compatible with both iOS and Android; you can push notifications from your phone to Stark. Last but not least, you don't need to charge the Stark. You can find the Stark hybrid smartwatch on Kickstarter.



## ChargeWrite

The creators of this pen call it the "world's coolest pen." Let's find out why. The ChargeWrite comes with a built-in 16GB flash drive and powerbank. That's right, this pen works both as storage and charger. ChargeWrite also makes use of a universal smartphone tip, i.e, it works with both lightning ports and microUSB ports. Of

course, it's not called a pen for nothing. When not in use as a powerbank or storage unit, ChargeWrite can still be used a ballpoint pen; and they're giving free replacements for all their Indieogo



backers. But that's not all, you can use the ChargeWrite as a stylus as well. To charge the ChargeWrite, you can pull off the top half of the pen to reveal a USB plug. ChargeWrite can hold up to 1000 mAh of charge. Look for ChargeWrite on Indieogo if you're interested in getting one yourself.

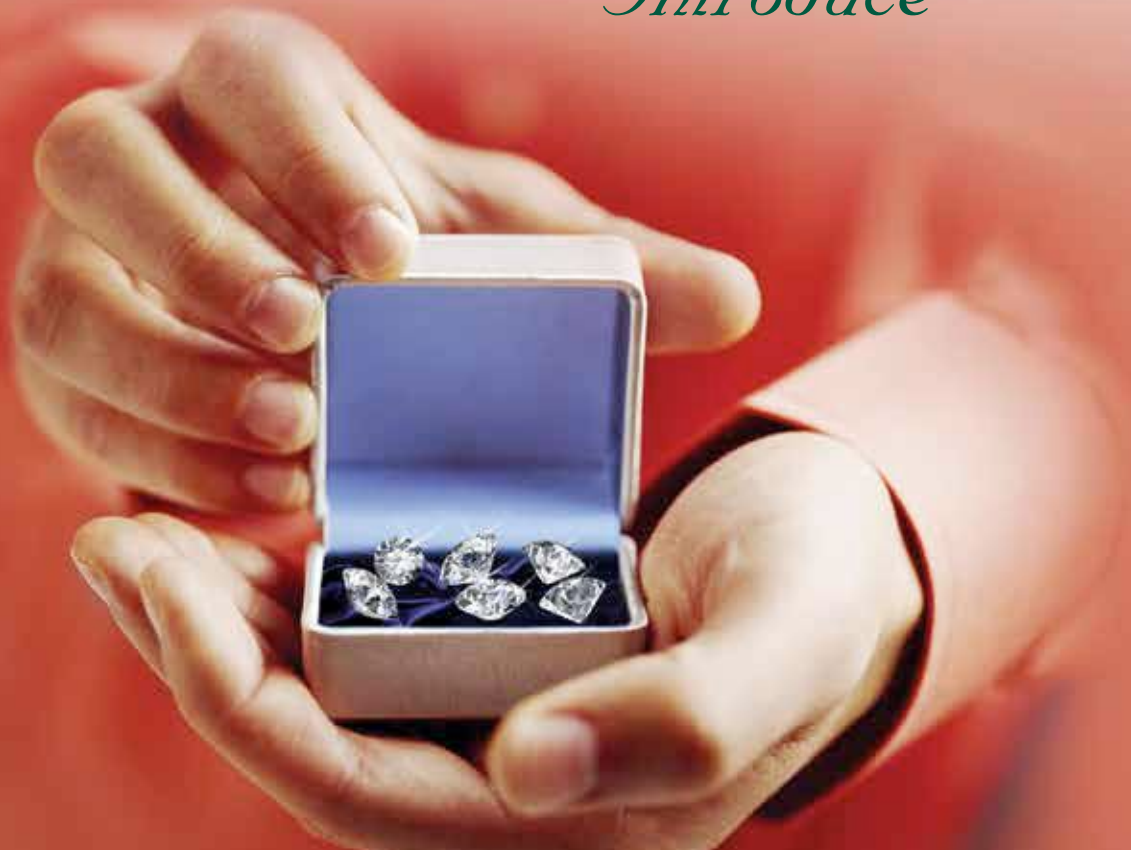


## Gameband

The Gameband is a powerful smartwatch that's been made specifically for, you guessed it, gamers. Gameband runs on a Qualcomm Snapdragon Wear 2100 processor. It's got its own Android OS and comes with its own suite of apps. You can put a microSD into the Gameband as well, turning it into a portable storage device. You can then access data in the Gameband via Bluetooth as well. Gameband has partnered with the likes of Atari and Terraria, to bring those titles to your wrist. You can expect classic titles like Pong, Centipede and more to run on the Gameband. Furthermore, there will be an Atari Red version and a Terraria version of the Gameband as well. You can expect a mini-version of Terraria for the gameband. Design elements from the game have also been used within Gameband's interface. You can of course still use the Gameband for other basic smartband applications. Find Gameband on Kickstarter.



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GREED

# AUTO

*Your one stop destination for a monthly dose of all your automobile launches and desires.*



## 2018 Ford Mustang

Ford's classic Mustang is getting an upgrade. The new 2018 Ford Mustang will feature a much sportier look. Although, it wouldn't be much of an upgrade if it was just the looks, right? The new Mustang will come with a host of new and changed features. One of those features is the addition of MagneRide magnetorheological adaptive dampers, which will be available on both EcoBoost and GT Performance Packs. Instead of the old 3.7-Litre V6, the new Mustang will house a 5.0-Litre V8, with improved horsepower and torque. The default horsepower of 435 was capable of boosting with the aftermarket calibration pack that Ford Performance sells. It would let you boost the horsepower of the Mustang GT

from 435 to 472. This is likely to be available in the new Ford Mustang as well. The company will offer both port and direct fuel injection options. There's also the option for a 10-speed automatic transmission alongside a 6-speed manual transmission. Manual will come with twin-disc clutch and a new dual-mass flywheel.

The new Mustang's exteriors also have some changes. The car looks significantly different from its predecessor with the hood lowered by 20mm. Other than that, there's a new lower rear diffuser in the back and a decklid wing for Performance Package models. As for interiors, the old analog speedometer and tachometer have been replaced with a 12-inch digital gauge cluster. The new model will also incorporate an optional active exhaust so that drivers will be able to control the noise of the engine at will.



## Mercedes AMG 2018 GT C

AMG is completing its 50th anniversary this year. In celebration, Mercedes is rolling out the AMG 2018 GT C at the Detroit Auto Show this year. The AMG GT C is a two seater hardtop. It houses a 550hp twin turbo 4-litre V8 engine, one that offers an impressive 0 - 100km/h in just 3.7 seconds. As for top speed, the GT C can reach top speeds of up to 315km/h. Other than the above, the new GT C will feature rear-wheel steering, an electronic limited slip differential and active air management. It comes with a number of louvers under that can open and close as required to assist with cooling the engine and with the vehicle's aerodynamics. The launch model of the car will be the Edition 50, which is limited to just 50 cars. The edition 50 boasts matte black externals, and a black chrome exterior trim. As for interiors, they will feature silver pearl and black Nappa leather. There's no pricing info yet, but expect to see the Mercedes AMG 2018 GT C at car dealerships sometime around summer this year.



GREED

# DROOL MAAL

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



## Vertu Constellation

British luxury smartphone manufacturer Vertu seems to have made a home for itself in this section. The rate at which they dish out luxury smartphones month after month, it's no surprise. This time, they've come out with the Vertu Constellation. Like most Vertu smartphones, this mobile device is handcrafted down to the very last detail in England. As with most Vertu smartphones, you can customise your own Constellation with cases ranging from leather to ostrich and even snake skin. The phone comes in-built with an anodised Aluminium frame and a Ruby shortcut access key. The feature that makes the Vertu Constellation stand out the

most from other phones from the brand is that it's the first to allow fully encrypted calls. This is thanks to the in-built tech from SilentCircle. Other than that, it's also the brand's first phone to have dual-SIM functionality and comes with a Sapphire crystal display.

### SPECIFICATIONS

**Android 6.0; SoC:** Qualcomm Snapdragon 820 | **RAM:** 4GB | **Storage:** 128 GB, expandable | **Display:** 5.5-inch 534ppi Sapphire crystal display | **Battery:** 3,220mAh | **Camera:** 12MP main; 4MP front  
**Price:** ₹4.75 lac approx.

## The Louis Vuitton Mouse Pad Gaston

Luxury brand Louis Vuitton have dabbled in many things. They've partnered and collaborated with many companies to put the LV brand on a large variety of objects. Handbags, trunks, smartphone cases, the list goes on. Well, you can add a mouse pad to the list as well. That's right, Louis Vuitton's Art of Gifting collection features a mouse pad. In the words of the brand itself, "Crafted from fine leather, this mouse pad features an embossed VVN corner in a complementary color for an understated Louis Vuitton signature. A subtle status symbol, it completes our elegant office set." There's three colour variations to choose from: Navy Blue, Grey, and Red. This mouse pad will set you back a whopping \$395 (Rs. 26,500/- approx). We're not sure if we'd spend that much on a mouse pad, but if you really want that LV monogram on your desk, head to Louis Vuitton's website.



# Iron Man Mark 43

Chinese toy maker The Toys Asia have gone and created a life-sized Iron Man armour. That's right, it's life sized. But, and that's a big but, you're not going to be able to wear it or anything. It does make for a really neat display piece though. Especially if you add the fact that the armour actually opens up, and in a manner very identical to the actual armour itself, from the movies. The armour features 46 motors that power



its 567 parts. You can open the armour up and get a nice view of its intricate insides. Since you're not going to be wearing this, the armour comes along with a remote control to open and close it as needed. The armour is accompanied by its own display stand. Priced at \$360,000 (₹2.4 cr approx) this suit of armour is a must-have for any diehard Marvel fan.

Actually, we're quite sure even those unfamiliar with the Marvel Universe will be quite impressed by this toy.

# ColorWare PlayStation 4 Pro Retro

When it comes to customising electronics and gadgets, not many do it better than ColorWare. This time around, they've customised the new PlayStation 4 Pro. Taking a step in the retro direction, they've got the brand new Pro, looking like the good old PlayStation (see what we did there?). The Retro Pro has been recoloured to, you guessed it, classic grey, and the PlayStation logo sits in the centre of the top-side, in its classic mix of red, green, blue, and yellow. ColorWare also ensure the quality of their custom products, in their words, each of their products pass "intense phases of disassembly, cleaning, masking, painting and inspection before being buffed and reassembled." This customised PlayStation 4 Pro will be a limited edition and there's only 25 of them up for grabs. At \$899 (₹60,200 approx.) each, we're assuming they're already sold out.



## APP WATCH

### Shopmatic Go



If you own a product based business, e commerce is the key to your success right now and setting up an online store for your products is absolutely necessary. Shopmatic Go aims to make that as easy as if can get. While the Go is what you need to set up a pretty basic online store, some of the Pro features like a custom domain, international payment support, analytics etc are necessary if you want to set your store apart. The app is free and it will allow all individuals and merchants to develop their online stores by snapping pictures of their products, enabling payments, and selling their products by sharing on social channels.

**Website:** <https://goshopmatic.com>

### Energy Bar



The amount of battery left on your smartphone is something you'll always want to know, especially on Android. Sadly, on most smartphones it takes you almost three to four steps to actually be able to know how much juice your phone has to spare. Energy Bar is a simple way to know the same, with a coloured bar on top of your phone's screen that has different colours to indicate different percentages. For an app this simple, you get quite a few options to play with, like the thickness of the bar, the way it handles colours and more. In-app purchases remove ads and enable gradients on the bar.

**Play Store:** <http://dgit.in/EnergyBarPS>

### Pickle



We can almost hear you go "Not another note taking app!" Well, we like to keep our lives organised, and Pickle is a note taking app like no other. If you swear by Slack, the team messaging tool, then you'll be right at home with Pickle when it comes to note taking. The app converts note taking into a conversation, where you can organise your notes using hashtags and search the same hashtags later.

It also supports photo notes, GIFs and URL previews, even if they are video URLs. You can also customise it to look the way you want it to, with adjustable font size, themes and colours.

**Play Store:** <http://dgit.in/PicklePS>



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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.*

## Mahersoft INDIE 3D Printer

Based off the all too familiar rep-rap design, the Indie 3D Printer is brought to you by a Mumbai based startup – Mahersoft. Featuring a heated bed, mood lighting and a snap on extruder, the Indie is focused on ease of use. Not only is the extruder easy to service but it supports a multitude of filament types. Currently up for a pledge amount of \$549 on Indiegogo, the Indie is quite the budget 3D printer. And what's better is that the software used is open source so your costs are brought down to just the 3D printer and the filament. It should be noted that most 3D printers in its class retail for roughly 20 per cent more. The device is still a prototype and would require a few more firmware revisions before exiting the prototype stage. We did notice certain snags like certain layers not coming out too well done or sometimes the thermistor would get pulled out, the former resolvable via a simple firmware update and the latter can be solved with cable ties. If you like prototyping and want something to really speed up your prototypes then the Indie 3D printer is a pretty neat device for that.

**Price:** \$549 (₹36,800/- approx.) (Introductory offer)



## Syska Sonic LED

You're probably tired of all the RGB madness happening in the PC peripherals world so maybe you'll roll your eyes with this one as well. The Syska Sonic LED bulb is what you get when you take an everyday LED bulb and club it with an audio player, and then add a dash of RGB madness. The bulb is quite bright when set to its usual pure white colour but the moment you switch to a different colour the brightness does scale down. With a jack of all trades kind of product, you really can't expect it to be the best in all aspects and that's where the app falls short. We wish Syska had paid a little extra attention to the app, otherwise this is a pretty neat product.



### SPECIFICATIONS

**Power:** 5W | **Lumens:** 500 | **Wireless Range:** 10 m | **RGB:** Yes | **OS support:** iOS 6+ and Android 4.3+ | **Base:** E27  
**Price:** ₹2,999



## 3D Doodler Pen

Drawing in 3D sounds easy right? Well, it's definitely not as easy as drawing on paper; there's a learning curve. But we were drawing 3D stick-men (albeit, really bad ones) in no time. Using the pen was easy, plug it into a power source, give it a minute or so to heat up. Insert the plastic string filament into the back; there are two buttons to load and unload the string. All you need to do now is hold down a button near the front and watch the plastic flow out the tip. Speed of flow is adjustable via a speed controller. Near the speed controller you have the temperature control which you may need to adjust depending on the filament you're using. That's about it, you're drawing in 3D now. Price: ₹5,999

## Oral-B Pro 2000

We don't normally review gadgets that go into bodily orifices, but when we do they feel so freaking good. Fine fine, we've been getting a little carried away with the meme references this month (you'll realise what we're talking about as you progress with reading this magazine), still, it doesn't take away from the fact that the Oral-B Pro 2000 is an excellent electric toothbrush. It has two modes – a sort of pulsating gum massage and the other a regular brushing action. The device has a pressure sensor that lights up letting you know when to ease up. Additionally, it has a 30 second timer which is useful for knowing when to switch to another part of your mouth. Ideally you are supposed to spend 30 seconds in each quadrant totalling up to a 2-minute complete cycle. If two minutes seems less to you, we aren't surprised. But the brush head oscillates so fast in those two minutes you would have probably made 5-minutes worth of strokes using a regular brush. The efficiency shows – within a few days of usage your teeth do start looking visibly better.

Although we would've liked to review the Oral-B Precision Black 7000 – since that one is a true smartbrush which connects to your smartphone to give you real-time feedback on your brushing habits – it's still not available in India officially. In the meantime however, at a price of ₹5,800 the Pro 2000 is an excellent choice to enhance your dental hygiene.



### SPECIFICATIONS

**Product Dimensions:** 11 x 5.5 x 25.3 cm | **Weight:** 272 g | **In-handle Timer** | **Modes:** Daily Clean and Gum Care | **Pressure Sensor**  
**Price:** ₹5,800

## Samsung Gear S3 Frontier

Samsung's Gear S2 and its rotating bezel was a big step forward for how a smart device on your wrist should be interacted with. In its second iteration, Samsung has made it even better. Unlike the Gear S2, the Gear S3 looks less like a toy and more like a real and rugged watch. The Frontier has a 1.3 inch Super AMOLED panel 360p display, with bright and vibrant colours. The Frontier is also IP68 certified, meaning you can take a bath with it, or go out in the rain while wearing it if you need to.

The OS of choice for the Gear S3 is the Tizen OS. While the OS and interface is far smoother and faster than competing Android Wear, or even Apple's Watch OS 2, the downside is that there's really no apps to use with it. The Samsung Gear S3 Frontier is as good as smartwatches can get right now. The Gear S3 Frontier and Classic are also compatible with iOS devices; it doesn't lose most of its functionalities, as most Android Wear smartwatches do. The Samsung Gear S3 Frontier doesn't make smartwatches perfect, or even useful, but it's a step in the right direction.



### SPECIFICATIONS

**Size:** 1.3-inch | **Dial Dimensions:** 46 x 49 x 12.9 | **Weight:** 62 g | **Display type:** Super AMOLED display | **Resolution:** 360 x 360 | **Clock face:** Analog | **Battery:** 380mAh (92 hours)  
**Price:** ₹28,500/-



## Garmin Forerunner 35

Featuring a minimalist design, the Garmin Forerunner 35 is what you'd call a budget fitness tracker. We're obviously not counting the cheap knock-offs. There's no touch-screen, and there are no fancy features to the device but the one place where Garmin hits it out of the park is with the accompanying smartphone app. Along with personalised calibration, the amount of data that this sports watch collects is insane. It's everything you'd want from a fitness tracker with a good level of accuracy. The only thing lacking about the Forerunner 35 is its design. The monochrome low resolution screen might throw off those who'd like to show off but for the serious runner, this should be a definite carry on.

### SPECIFICATIONS

**Physical dimensions:** 35.5 x 40.7 x 13.3 mm | **Display size:** 23.5 x 23.5 mm | **Display resolution:** 128 x 128 pixels | **Weight:** 37.3 g | **Battery:** lithium-ion | **Battery life:** up to 9 days, watch mode; up to 13 hours in training mode | **Water rating:** 5 ATM  
**Price:** ₹15,990



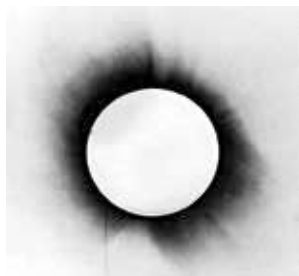
## TEMPTATION

# 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*

## ALBUM REVIEW

# All Our Gods Have Abandoned Us



**A**ll Our Gods Have Abandoned Us is the last album from British band Architects to have a contribution from guitarist and songwriter Tom Searle, who passed away last year due to cancer. Needless to say, he put his soul into his last work along with his band members. Describing the album subject to utmost brevity, the music is

heavy and complex without going completely bonkers. The riffs and timings, the mood is dark and energetic, and the lyrics are poignant, to say the least. All talented souls produce art but the message of this album is bordering transcendental, perhaps thanks to Tom's closeness to his personal end. He left behind his realisations for the world in a sonic package that resonates with your senses (if you're into screamo metal). The philosophically inclined, and those in search of the meaning of their life should definitely not miss this album. It's a piece of art that will mostly appeal to angry teenage souls.

**Rating:** ★★★★★

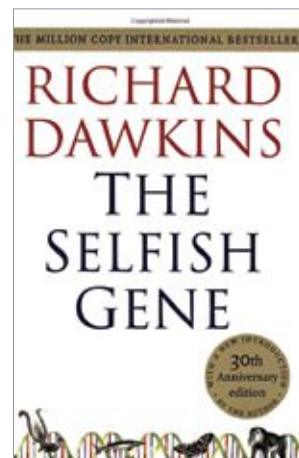
– Sahil Dawka

## BOOK

# The Selfish Gene

Richard Dawkins

**I**t was quite a fortuitous coincidence that I started reading The Selfish Gene in the run up to an issue about memes – the very word was coined in this monumental book! The central theme revolves around understanding if true altruism exists in nature and whether it is the result of genes that are themselves altruistic. As you flip through the pages you'll be introduced to fascinating concepts such as kin selection, parental investment, and reciprocal altruism. As it turns out organisms are most often altruistic because they are engaged in the evolutionary game of iterative prisoner's dilemma that spans eons – basically tit for tat. Sounds like mind bending stuff right? The way Dawkins explains it though, even non-scientific readers would easily understand difficult concepts. Take for instance a possible cause for the skewed balance between genders when it comes to rearing the young. Most often in nature we find the female is burdened with this arduous task. The disparity starts from the very gamete stage where the female gametes are nutrition rich and fewer in number while



males go for numbers with minimal investment. You'll find many other examples; sometimes even for seemingly counterintuitive evolutionary traits. Genes are immortal and they will do whatever it takes for copies of themselves to be transmitted through the ages – even if this means controlling and coercing their survival machines (the animals they reside within) into strange acts. A nice bonus touch to the 30th anniversary edition are the interesting footnotes added by Dawkins where he examines how (if at all) his thoughts on a particular topic have changed since the first edition as a result of newer research.

**Rating:** ★★★★★

– Siddharth Parwatay



**Bill Nye Saves the World**  
Bill Nye is returning to TV with a new reality show. *Actual* reality, the factual kind. The show will explore everything science, and in a world full of alt-facts, we really need this.

Release: April 21



**Logan**  
The third and final installment in the Wolverine series and Hugh Jackman's last movie as the Wolverine. We're both, excited to see this one and sad to see Jackman go.

Release: March 2

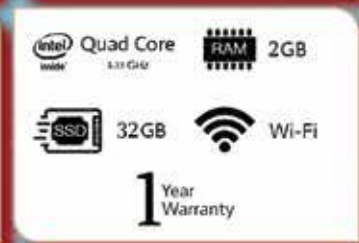


**Horizon: Zero Dawn**  
This action RPG is set in a world dominated by Robot Dinosaurs (*Robot Dinosaurs!*). Do you have what it takes to survive when you're not at the top of the food chain?

Release: February 28

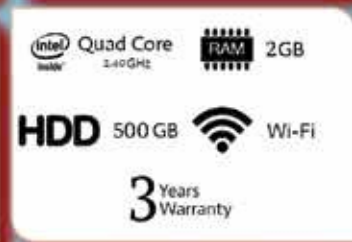
# ICTS SMART PC

PC in Palm



# ICTS BRICK PC

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**Feature**

Find out how Blockchain is going to be the next big enabler of everything.

**How did Mars cool down?**

After more than four and a half years of exploring Mars, scientists can't seem to figure how ancient Mars got so warm. <http://digit.in/liquidMars>

# THE DROIDS YOU'RE LOOKING FOR

**IT'S 2017 AND YET, ROBOTS AREN'T DOING EVERYTHING FOR US —  
ALTHOUGH THEY ARE GETTING PRETTY CLOSE.**



Arnab Mukherjee

[arnab@digit.in](mailto:arnab@digit.in)

**A** factory in Dongguan, China – the one belonging to Changying Precision Technology – replaced 90% of its 600 strong human workforce with robots – and soon saw a 250% rise in productivity and a 20% drop in defects. It is undeniable that we have arrived at an age where robots taking our jobs is not longer the stuff of conjecture.



## REMEMBER TALOS?

To begin with, let's clear up any confusion about what constitutes a robot versus a mechanical machine. While according to some definitions early computing machines as well as mechanical clocks would technically

be robots, what we are looking at here are humanoid machines – the kind that mimic humans in purpose and shape.

In various cultures, some artificial creations have always been brought into the world by beings of mythical powers – Clay Golems, Talos from Greek mythology and more. Some of the earliest stories (since there's barely any physical evidence to credibility) and concepts date back to as far as the 4th century BC when Greek Mathematician Archytas of Tarentum proposed the design of a steam-propelled bird. But one of the first documented designs of a humanoid robot came much later in Da Vinci's notebooks from the year 1495. The designs, most likely based on his anatomical research for the Vitruvian man, were intricate and detailed a mechanical knight that could sit up, wave its arms and move its head and jaw.

The 18th century saw a lot of activity in the field of robotics. Automaton in this century were actually capable of acting, drawing, flying and even playing music – but mostly as toys or means of entertainment for the rich. Jacques de Vaucanson was a robotics pioneer of



Talos represented on an ancient coin

IMAGING: PETERSON PJ



## Smart mahogany remote

The Turn Touch smart remote may not have voice controls or a touch screen, but it is made out of solid mahogany <http://dgit.in/TurnTouch>



## 240 M year old fossil

Scientists have unearthed the fossil of a pregnant reptile that missed her due date by 240 million years. <http://dgit.in/240fossil>

Origins

this time who designed and constructed multiple iconic automatons of that era. In 1737, Vaucanson built the Flute player, The Tambourine Player and his most famous work, the Digesting Duck. This bird automaton had 400 moving parts in each wing (an astonishing number for that time) and it could actually flap its wings, consume water and grains and then defecate. This was achieved through a hidden compartment of fake 'digested food'. Such frauds were commonplace around the time as the onlookers mainly viewed automatons as means to entertain.



Da Vinci's design was way ahead of its time



**YAY! THEY'RE MORE LIKE US NOW!**

The 19th century saw multiple areas of progress that made advanced robotics (compared to the impractical automatons of the 18th century) a greater possibility. The automated Jacquard loom of 1801 and Babbage's Difference Engine in 1822 played key roles. In terms of theory, it was in 1847 that George Boole represented logic in a mathematical form understandable to machines, which is what we know as Boolean Algebra. Another significant development was the patenting of a remote controlled robot boat in 1898 by Nikola Tesla, which would form the basis of the wireless control that we see in space exploration robots even today.

It wasn't until the 20th century that the word 'Robot' was coined. In the 1921 play R.U.R (Rossum's Universal

Robots), writer Karel Capek used the word to denote automatons in the story. He credits the word to his brother, who derived it from the Czech word 'robota' that means servitude (kind of setting the intent right there). But a major, and perhaps the most significant, cultural phenomenon when it comes robotics was Asimov's science fiction writing in the 1940s. In fact, the word 'robotics' is said to have come into common parlance due to his work. Most importantly, he conceived the three laws of robotics:

- **First Law:** A robot may not injure a human being, or, through inaction, allow a human being to come to harm.
  - **Second Law:** A robot must obey the orders given to it by human beings except where such orders would conflict with the First Law.
  - **Third Law:** A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.
- He also added a zero law later:
- **Zeroth Law:** A robot may not harm humanity, or, by inaction, allow humanity to come to harm.

In 1928, Japan's first humanoid robot, Gakutensoku, was designed and built by Makoto Nishimura, a biologist. It could perform some gestures like move its head and hand, and also change its expression. Another significant humanoid built during this time was Elektro, a robot built by the Westinghouse Electric Corporation somewhere between 1937 and 1938. This one could walk by voice command, speak about 700 words (using a record player), smoke cigarettes, blow balloons, and just like the Gakutensoku, move his head and arms.



**HARDER, BETTER, FASTER, STRONGER**

Around the 1950s, Alan Turing and his contemporaries did some remarkable work in computing and artificial intelligence. In 1950, Alan Turing devised the Turing test as a means to determine whether or not a machine has the ability to think for itself.

The first industrial robot, the Unimate (for 'universal automation')



Elektro with Sparko

was created by George Devol in 1954 and patented in 1961. It was actually used by General Motors in a plant in Trenton, New Jersey to lift hot pieces of die cast metal and stack them up. Unimation, the world's first robot manufacturing company – founded by Joseph F. Engelberger and George Devol in 1956 – is popularly regarded as the foundation of modern robotics.

The 1960s saw a lot of interest in robotics as an academic pursuit. Also, interest in Artificial Intelligence was rife around this time with AI research labs being opened at M.I.T., Stanford Research Institute (SRI), Stanford University, and the University of Edinburgh.

The world was also introduced to ELIZA and HAL. The first mobile robot that could comprehend and reason about its surroundings was also built this decade by SRI (now SRI International). Shakey, which is what the robot was named, navigated using a combination of multiple sensor inputs, including TV cameras, laser rangefinders, and "bump sensors".



Early UNIMATE model





## Panasonic's car sensor

Panasonic has reportedly developed a new image sensor technology that should improve night vision in vehicles. <http://digit.in/ImageCar>



## Passenger carrying drone

Residents of Dubai are reportedly getting an autonomous quadcopter capable of carrying passengers this summer. <http://digit.in/taxiDrone>



R2D2 and C3PO have sparked countless minds in the world of robotics



### A NEW ROBOTIC HOPE

In the 1970's, manufacturing processes were increasingly using robotic arms to increase efficiency or get dangerous things done. Both the PUMA (Programmable Universal Manipulation Arms) and the SCARA (Selective Compliant Articulated Robot Arm) were developed and extensively used in the 1970s.

But something significant happened in the world of robotics in this decade that would inspire scientist and engineers for decades to come – Star Wars was released. The movie, set in a universe where humans and robots coexisted in perfect harmony, inspired many to look at the next level of human-like robots.

### FROM HUMANOID TO HUMANLIKE

In 1986, Honda began a research project to develop robots that could interact with humans. Their goal was a robot that “should coexist and cooperate with human beings, by doing what a person cannot do and by cultivating a new dimension in mobility to ultimately benefit society.” Although this project would take almost a decade

to bear fruit, its results would be highly significant in the coming years.

In 1989, a research paper changed the direction of rover research. So far, robots were being used for space exploration, but the direction of design to build one big multipurpose robot instead of multiple small ones, was advocated by this paper; it influenced the way we designed rovers.

The 90s were full of robotic advancements, as if decades of research and study was finally culminating into results. For example, the 8 legged walking robot Dante explored Mt. Erebus in Antarctica. Dante II, a more robust successor, subsequently explored Mt. Spurr in Alaska in 2004. The Cyberknife, a stereotactic radiosurgery robot released in 1994, could treat tumours non-invasively with an accuracy that was comparable to human doctors.

After almost a decade of research, Honda's P2, and then P3 were ready to be publicly demonstrated. The former was the first self regulating bipedal robot while the latter was Honda's first completely autonomous robot.



Honda's P2 would go on to be further refined



ASIMO



AND WE'RE THERE... ALMOST!

The dawn of the new millennium saw robotics reach everyday life and people like never before. The ASIMO, the result of Honda's decade and a half worth of robotics research, was introduced to the world and it was the most advanced robot of its kind at the time.

Weighing only 54kgs, ASIMO (Advanced Step in Innovative Mobility) was capable of running, walking, communication with humans, facial and environmental recogni-



AIBO


tion, voice and posture recognition, and interacting with its environment. Estimates in the same year showed that more than 700,000 robots were being used for industrial purposes around the world – more than half of them in Japan.

The AIBO also gained popularity around this time. Artificial Intelligence Robot, or AIBO, was a robotic dog capable of interacting with humans. While intended as a consumer market entertainment device, the AIBO had several remarkable capabilities like responding to over 100 voice commands and talking in a tonal language.



BEHOLD THOSE WHO INHERIT THE EARTH

To most of us, that statement might appear too exaggerated. While we are not claiming otherwise, it would be great if you could look around you and realise how much the world is already dependent on robots. These robots, by the way, are more sophisticated than they have ever been. The Roomba automatic vacuum cleaner has sold millions of units, showing how willing we are to welcome domestic robotic technology into our homes.

On the other side of the power spectrum, there are drones that can navigate the globe by themselves and perform dangerous aerial strikes while the human controller is seated in the safety of their office (or even asleep). On the other hand, artificial intelligence programs have beaten the world's best at their own games and even learnt how to bluff. 





### Drone propeller guard

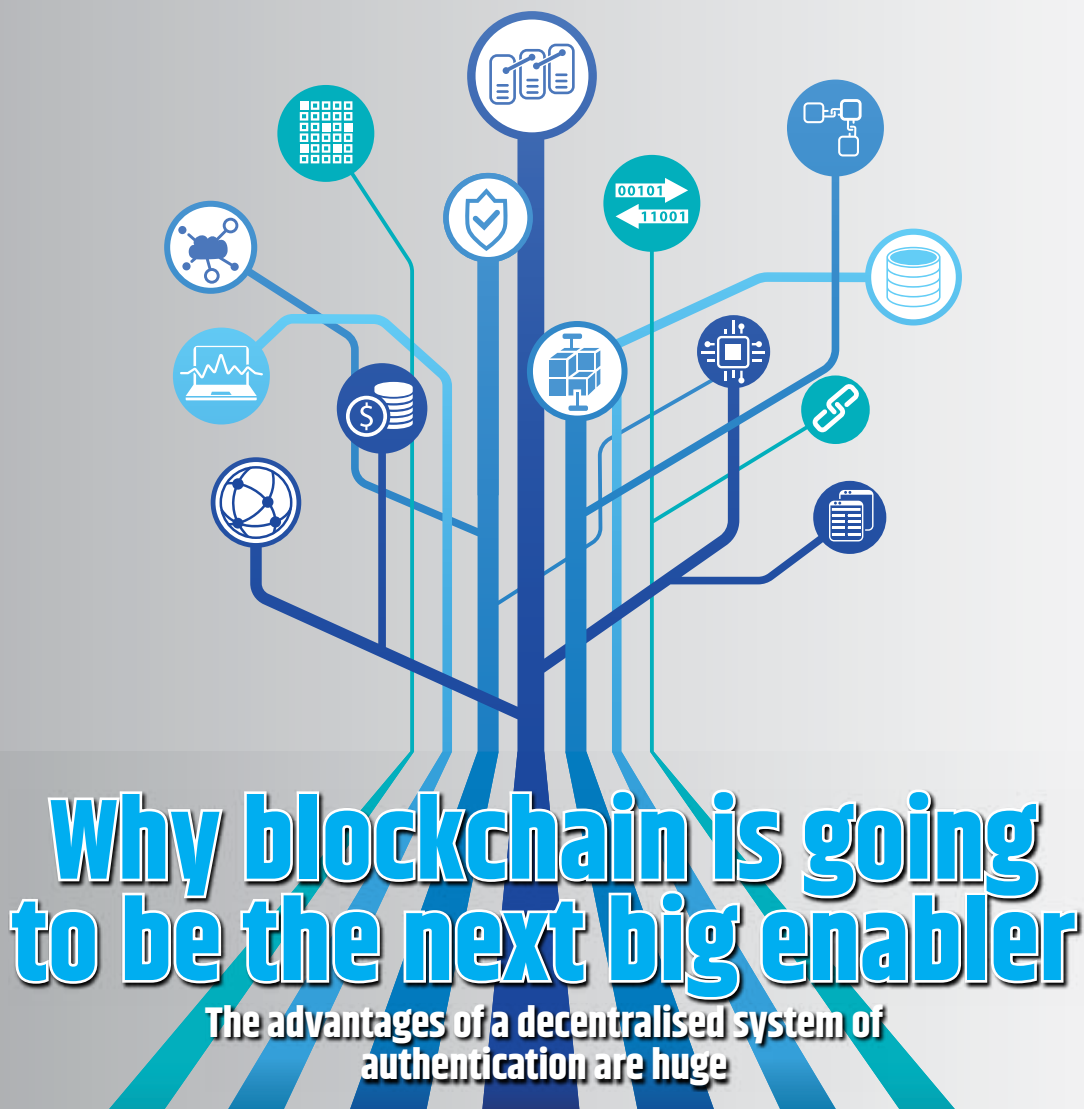
DJI recently launched new accessory for its Mavic Pro drone, including a propeller guard to help protect your drones. <http://dgit.in/WingGuard>



### Volata 1c smart bike

Smart bikes are popping up everywhere and the new Volata 1c is a slightly cheaper variant of their older Model 1. <http://dgit.in/Volata1c>

Feature



Abhijit Dey  
[abhijit@digit.in](mailto:abhijit@digit.in)

**U**nless you've been living under a rock, you probably know or must have heard about bitcoins. For the uninitiated, Bitcoin is a cryptocurrency that has its own payment system. In 2008, an unidentified person who went with the alias Satoshi Nakamoto, presented a white paper titled "Bitcoin: A Peer-to-Peer Electronic Cash System". Based on a peer-to-peer network system and distributed timestamping server, it removes the necessity of a financial institution or a trusted authority to authorise payments. After releasing the first Bitcoin software in early 2009, Satoshi open

sourced the software later in the year. We won't be going into detail about what Bitcoin or cryptocurrencies are, but rather focus on the technology behind Bitcoin – Blockchain.

### What is a Blockchain?

Blockchain is fundamentally a database system with some differences. In a traditional database, the data is stored on a central server which is trusted to maintain the centralised database. Whereas in a blockchain, the database is decentralised so that the burden of trust isn't upon one server, but instead on a network of systems. Such a model takes the help of numerous computers or nodes, each managing a copy of the same database.

### How does a blockchain work?

A blockchain comprises of the database which keeps record of the history of transactions or data that has taken place. Being a shared or decentralised system, the database is shared among the nodes through a peer-to-peer network used by the same nodes to communicate and update the database whenever there's a new transaction. In this way, any changes occurring in the database will be broadcasted to all the nodes participating in the network. As long as the network is online, the database will always be accessible to the other nodes, even if one or two of them leave the network. This is one of the biggest advantages over traditional centralised database systems since trans-



## New 'category-defying' PC?

Corsair recently teased a fully assembled PC they call "The One". Pricing and specs are yet to be revealed. <http://digit.in/CorsairOne>

## Fire TV boss joins Apple

Apple hires Timothy Twerdahl, the director of Amazon's Fire TV division, as a new vice president for their TV division. <http://digit.in/AppleTVboss>

actions would be delayed or denied in an event when the central server suffers downtime or gets compromised. This is how the peer-to-peer network operates ensuring that the database is never lost. Let's move on to talk about how the database is maintained.

In its initial state, generally called the genesis state, the entire network is notified and nodes are initialised. Now, transactions are broadcasted to the network so that the database can be modified with the required entries. These new entries aren't directly added but held up in a temporary state or pool consisting of one or more transactions. A finite collection of these pending transactions are called blocks. The transactions inside a block together generate a hash key or a digital signature unique to the particular block and

previous state. Because of the nature of the network, everyone will be able to notice the mismatch in the hash values and flag it off as fraudulent. As more transactions are broadcasted, more blocks will be created to form a chain, hence known as a blockchain.

If an attacker with a malicious intent wanted to modify any of the older blocks high up in the chain, it will be a foolish effort. Why? Well, this is another amazing security feature of a blockchain. You already know that modifying the transactions in a block to change the hash signature. You also know that the blocks are linked to the previous block using the hash signatures. If someone modified a block in between, the hash value of that block will change and break its link to the previous block. This will render all the

of blockchain is that this technology can be used to record or store any kind of information on a public audit or ledger system. Now, that you have a rough idea about its mechanism and why is there a need of blockchain, we will explore how this technology is going to enable sectors in the near future apart from what it was originally intended for – cryptocurrency.

## Banking

Another sector where the use of blockchain is widely being promoted and funded is banking. Banks already have massive databases. Once they move to blockchain, banks will be able to process payments faster and more accurately. According to a report by Accenture, investment banks will be able to cut \$8 - \$12 billion a year by 2025 by introducing blockchain technology in their infrastructure. ICICI Bank was the first bank in the country to execute a transaction using blockchain last year. They exchanged and authenticated remittance messages and original international trade documents on a custom-made blockchain.

Recently, the State Bank of India launched a blockchain finance consortium called Bankchain. They've partnered with several technology firms and local commercial banks with technical assistance provided by IBM and Microsoft.

## Music distribution

The challenges faced by the music industry is the inefficiency tracking music ownership and payments worldwide. Due to the lacking process of ownership and rights, it becomes difficult to manage the distribution of payments to everyone concerned with the project – a process taking years at times. By creating a new blockchain codec, the content will be added along with the information to the blockchain ready to be broadcasted.

Every time a new song is created by artists or record labels, it will be encoded with a blockchain codec and pushed onto the global database. From then on, the digital service providers



The whole network plays a part in authenticating blockchain transactions

set of transactions. With the Genesis state already existing, the new block should obviously denote the genesis state to be its previous state. The hash key exactly does the same by creating a link to the previous state. This linking is essential to the security of the transactions in the first block. The integrity of the first block is also maintained since if any changes were to be made to the transactions inside the block, the corresponding hash will change. This would result in a mismatch of the hash with the hash previously added in the

blocks following the newly modified block to become invalid. The nodes already store the database across the network and when the new block is broadcasted, a mismatch will be detected by the nodes. This is practically how a blockchain works.

## Why do we need blockchain?

The simple answer is security. A distributed system is difficult to penetrate. For an intrusion attempt to be successful it'll have to be launched on all nodes simultaneously. Another beauty



### \$10,000 EV for kids

The EV3 Junior is an all-electric three-wheeled EV made by British car company Morgan that will cost \$10,000. <http://dgit.in/juniorEV3>



### A VR arcade machine

Koei Tecmo Wave's new VR Sense is an arcade machine that lets you feel snow in your face and bugs at your feet. <http://dgit.in/VRsense>

Feature



What started off with Bitcoins will now enable growth in many other verticals

could tap into the codecs to make it accessible to their subscribers. Ujo-Music is a startup exploring the same where they're testing this open music industry standard. Imogen Heap, a British singer released her song Tiny Human on this platform, allowing users to purchase licenses to stream, remix and download through digital service providers. Heap will now be able to receive the payments directly from the users and then she can distribute the corresponding cut to her collaborators.

### Social media

Even though social networks like Facebook, Reddit and Twitter are free to use, you already spend a lot of time on them scrolling endlessly through your feeds. What if you could get paid to visit and contribute to a social network? Steemit is one such network that's trying to incentivise users for participating in their social media platform. The service works on blockchain so everything is transparent where the user's Steemit wallet can be viewed by anyone. You can earn Steem Power (SP) in the platform by garnering upvotes in your posts while upvoting also earns you curation rewards. Currently, there are over 70,000 users registered and on signing up, you'll receive \$4 to get you started. Existing social networks are dependent on user generated content

which is used by the company to earn money through advertising while you're given only the services on the platform. On Steemit, you have the opportunity to actually make money by contributing posts and blogging excellent content.

### Ridesharing

It's amazing how blockchain can be scaled and modified to support just about any sector, even ridesharing. One of the problems faced by any Uber-like service is govt. intervention to protect the interests of existing cabs. By introducing a ridesharing service independent of any central authority, no government will be able to exert control over them. This can be possible by implementing the service over blockchain. La'Zooz has already established a ridesharing model based on blockchain. The advantage of a decentralised ridesharing system is the release of control over the distribution of funds. Community members participating will collectively decide the rules on contribution and how the rewards will be circulated.

La'Zooz also includes miners, called ride-miners. In order to mine "zooz" tokens, the internal currency of the system, drivers have to install the app, turn on the GPS and drive around at a minimum speed of 10 kph. Zooz tokens can also be acquired by contributing code to the project and inviting others.


### Trading

Blockchain could make trading in securities more efficient. Private companies like t zero are trying to make digital trading secure and quicker. Based on blockchain, the ledger is fed with the existing market processes that reduces settlement time and cost. Another blockchain startup called Chain is working to work out a way of trading in private companies while working with NASDAQ.

### Identity

The advantage of having a blockchain-based ID is the decentralised nature of establishing your identity independently, making it secure and efficient to manage and track. The blockchain manages the keys, devices and usernames securely in a way that whenever the user logs in with apps, they are anonymous. Whereas their identity can be revealed and proven at any point of time.

### Online voting

Online voting can be implemented using a blockchain where the votes will be treated as transactions. The entire database or ledger of the votes will be stored distributed to all the nodes in the voting network whenever a new vote is cast. This way every node will have a backup or historical audit of the final count until a new vote is cast. Due to the blockchain approach of the database, votes can't be tampered in between. Another advantage of blockchain based voting system would be identity verification of voters while still staying anonymous. Only when the voter is authorised, they will be able to vote. My Vote and BitCongress have already presented a robust online voting system based on blockchain technology. In 2014, a Danish political party – Liberal Alliance – conducted an internal voting at the party's annual meeting using blockchain technology. It's natural for voting to eventually move online and now, with an efficient technology already existing, we might witness this happening soon. 





# THE MEME ISSUE

**EXAMINING MANKIND'S  
GREATEST INVENTION SINCE  
SLICED BREAD**

**WHAT DOES IT ALL MEME? .....Pg. 31**  
**THE UNIVERSAL TOOL.....Pg. 34**  
**LIFE AS A MEME.....Pg. 38**

# WHAT DOES IT ALL MEME?

## YOU CANNOT KILL AN IDEA! OR CAN YOU?

SAHIL DAWKA

feedback@digit.in

**T**echnology being increasingly ever present, it's no overstatement to say everyone is on the internet these days, in some form or another. Okay, maybe not literally everyone considering most reports peg global internet penetration at about 50 percent. Still, we doubt any of those other 50 percent will be Digit readers, so for all practical purposes yes, everyone is online these days... but we digress. The reason we're bringing up the internet is to delve into the second most popular form of entertainment on the internet, and this month's theme - The 'Meme'. When Richard Dawkins coined the term in his book, *The Selfish Gene*, he didn't imagine that it would take up a life of its own. The meme has since evolved, and perhaps even slimmed down, considering where it stands today. Viral as they are today, will memes ever die?



**THERE'S A MEME FOR THAT FOOL**

If you haven't heard of the Meme, hold on, that's what this article is here for. On the other hand, if you're a 9gag regular and can identify every

meme by name, you may think you know it all but we're here to tell you that you don't - that's also what this article is here for. Clever eh? The old "All roads lead to Rome" meme. Or is it the 'Destiny' meme, the illusion of choice? We'll get to that. First, a formal definition:

### MEME

*noun*

1. an element of a culture or system of behaviour passed from one individual to another by imitation or other non-genetic means.
2. an image, video, piece of text, etc., typically humorous in nature, that is copied and spread rapidly by Internet users, often with slight variations.

What most people think of when they read the word 'Meme' is the second definition, which is in fact a subset of the first. Today's Internet memes as you likely know them are sometimes gifs, and most often images with text overlays at the top and bottom, exclusively in the all caps Impact font style. These memes evolved - like most web phenomenon - in the 4chan crucible. Modern internet memes include text like "how

can she slap" to everything from videos to fake site links that get you Rickrolled. The videos could be popular and fun like Psy's record breaking Gangnam Style, or popular and distasteful like Rebecca Black's cringe



Eating with a spoon is a meme too

worthy Friday. Why limit ourselves to songs, even Richard Dawkins himself stars in a meme or two, where you can watch his amazing rebuttals to both stupid and intelligent questions.

Even as the first definition - the classical one - a meme is always in the form of information, whatever its substance, be it a ritual or the knowledge to make a katana. Without exception, memes are communicable, because of their form. The internet is a world composed entirely of information, so it is no surprise that is where most

memes have moved in order to survive and thrive at a rapid pace. Internet memes are a niche kind of meme, which is why many die so easily and none last too long. Another contributing factor is that internet memes generally provide entertainment value more than anything else, and things get old quickly.

So what is a meme really? An idea... A concept... A thought... All of that and yet more than that.



Since memes are replicators, it is very tempting to draw an analogy (as many do) with an existing and well-known replicator – DNA, or more aptly genes. In fact, the word ‘gene’ is the model Dawkins had in mind when he coined the word meme from ‘mimeme’, which is Ancient Greek and means “imitated thing”. The various traits of any specimen of any life form are representative of its genes, and are transmitted forward in time across individuals via the complexly simple act of replication. So too various aspects of human culture and social life are propagated in memes. However, this analogy is better not carried too far. Genes are a specific units of life’s chemistry. Despite much debate and discussion, it is still unclear what a meme exactly is. Actually, it would be strangely more appropriate to say, it is unclear how much a meme is. A meme is a pseudo-unit. Whether a word, a sentence, or an entire book, there are no lines when it comes to memes. A single meme is anything that has the meaning of a single theme. When they get any larger, they are to be called a memplex – many memes mutually supporting each other. For example, to someone only vaguely familiar with ‘Star Wars’, ‘Star Wars’ itself is a meme. To them it’s ‘that sci-fi movie with the laser swords and stuff’; but to anyone more knowledgeable, ‘Star Wars’ is an intricate memplex. Considering this new person to be only slightly more knowledgeable for simplicity, in the slightly expanded Star Wars memplex, the Jedi, the Sith, and the Force are mutually supportive

memes. They do not have to support each other literally, of course. The antagonist requires the protagonist and vice versa, if only to fight against. This again, may be thought of as an example of the Duality meme, which is a part of the ‘nature of the world’ memplex, which in turn is a part of the curiosity memplex.. And down the rabbit hole we go.

Instead of delving deeper into the abyss of defining a meme (which can only be done in terms of memes), let us consider some more of the characteristics of a meme so that we can notice and observe them in the real world:

### Imitation and virality

Memes spread via imitation. What is essentially done, when you share a post? Unless you made your own content, you just successfully imitated the creator of that post’s content. You spread someone else’s idea. Even if you



Spread memes that make the world a better place!

are intelligent enough to understand it, you didn’t create it. Even if you added your own caption or modified some detail, you just helped the meme evolve a little, and then you helped it spread when you clicked the ‘Share’ button. Actually, even if you made a meme, it’s going to die out unless enough people repost. Here is the first deviation from the Gene analogy: Genes (life molecules in general) have a design that ensures they replicate themselves. Their replication is an intrinsic characteristic. Memes on the other hand, replicate and evolve thanks to willing participants (assuming all participants have free will and think for themselves). Memes need people, sentient

beings, in whose minds they reside and spread from. Keep in mind, you are always at the end of the branch of the spread of any meme you come across. It is you who decides if the meme is worth storing in your brain and telling other people about, or better forgotten and never mentioned. Memes need your belief to be recreated rather than replicated. When it comes to internet memes, they need your reposts!

Memplexes like entire religions are a good example of well designed memes, even if they didn’t start as conscious designs but merely came about as memes for the inexplicable. Religions contain memes that help people cope better with the realities of the world, and so they spread. A large number of people like to believe there is a life after death, and so the meme survives. Although this meme has been around for a long time, imagine no one had ever thought of it before. When

people suddenly start liking the new meme of ‘life after death’, and we’d say it is going viral. Virality is exponential imitation, and a good meme is conducive to it.

### Unnatural selection and evolution

Genes undergo natural selection as a trial by fire in the real world. If they are not helpful (and sometimes they

are helpful by being unhelpful, such as the flamboyant plumage for the peacock) the individuals possessing those genes do not survive, and thus, they exit the gene pool. For memes, it’s more of a reality show than a trial by fire. Memes must proliferate in the socio-intellectual world, not the physical real world. The memes that survive and thrive are the memes that people like. And people like a meme when they relate to it, it helps them understand something, makes the world better for them, or they just generally find it entertaining. Unhelpful memes survive easily too if they are entertaining or compelling enough. In general, we tend to like memes which



contain a bit of 'me' - yes, 'you'. With so many different MEs and YOUS, there are no obvious rules. [One man's garbage is another man's treasure.] It depends entirely on the collective whims and moods of the populace the meme is entering. The meme must pass unnatural selection.

Memes are information, and so are genes, however there are key differences in this similarity as well. Life's molecules store information in an objective way, in a way that is actionable by itself. DNA, mRNA, ribosomes and the rest do not require special interpreters to give them life, they are a completely self-sustaining, self-replicating and hence self-evolving system. In contrast, memes are subjective. Though memes are also stored in a physical medium, they require subjective interpretation. A meme in the form of an English sentence is instantly dead to a Jarawa tribesman, whereas the relationship of lightning to thunder is a more universal meme. Memes sustain, replicate and evolve via all the multitude of selves that perceive and then either propagate or forget them. Each single person affects every meme he/she comes across and each meme is affected by every person whose mind it reaches. If nothing else, everyone can be responsible for the memes they spread in the world. Like genes, memes evolve via changes during replication. Yet again, there is a fundamental difference - when genes evolve, their underlying physical medium changes

with the information. The medium and the message of life are coupled. Change the most insignificant amino acid in a protein's structure and the efficiency drops a thousandfold, but for memes, it is all about the information. Whether you print on paper or view on a screen, Overly Attached Girlfriend is still gonna look at you the same!



.. or from on a cake ..



**SO YOU'RE TELLING ME,  
MEMES MAKES US  
WHO WE ARE?**

How did this whole meme meme begin?

Before Richard Dawkins approached the concept of a meme, he began by asking an apt question about human behaviour: Why do so many of us do things that we know are bad for us? What makes us consciously counterproductive and subliminally self-defeating? How can people give up their lives willingly? Just as every river or stream has a source, every effect should have a cause. So there


must be an answer to the question, and in looking for it, what better place to start than nature herself? Indeed there are examples of non-human life forms exhibiting self-defeating behaviour that leads to them landing up dead, contrary to the innate survival instincts. For example, some mice suddenly act fearless towards cats and end up eaten. This doesn't make sense until you learn

that a parasite (*Toxoplasma gondii*) hijacks the mouse in order to make its way back into the cat's gut and complete its life cycle.

In case of us humans, to really find the cause, Dawkins decided to look at who/what was benefitting from the person's self-destructive behaviour. There was the answer - the idea!

The ideal! The meme! When a person gives up his life willingly for his country, it doesn't help the person but it surely and efficiently helps spread the meme of martyrdom. In that one sense the gene and meme similarity rings very true - both are selfishly biased to their own propagation or survival, though not consciously.

Going by the general yet useful definition of a meme as a (pseudo) unit of cultural transmission, it would seem that memes are central to making us who we are, even if we haven't identified them all. Sometimes even when we don't know the background info associated with a meme, it can still trigger the appropriate feelings and we 'get' it. Humans are social animals and that is why we transmit or communicate in the first place - it is our innate need to bond. Perhaps memes are a medium that facilitates this bonding, allowing us to give and take parts of ourselves to share with as many people as can 'get' the meme. Perhaps memes are the simplest form of art. When a meme most accurately reflects our experience of the world, we call it truth.

Memes have everything to do with meaning, they are intrinsic to the way we conscious sentient beings experience and make sense of the world. Just as life exists, and will continue to, because our environment is conducive to it, memes will continue to exist as long as humans can perceive meaning. Which gets us thinking: will memetics help us understand the psyche, consciousness and intelligence? Once all humans are in pods a la The Matrix, will the AI have its own memes? Thanks to all the memes available on the internet, it won't have any trouble simulating a satisfying world for us, that's for sure. 



Not sure if you get it ..

# THE UNIVERSAL TOOL

**WHAT WE SEE AS INANE HUMOUR PROBABLY HOLDS  
THE BLUEPRINT TO THE FUTURE**

ARNAB MUKHERJEE  
feedback@digit.in

If you've been reading the cover stories in sequence, by now, you are probably well versed with the true nature of the meme. At least by itself, a meme is more than just the humorous images that you share online, and in fact, encapsulates any cultural idea or trend that is passed on from person to person. And in case, we got you thinking if there is some underlying phenomenon deeper than what is observable with a cursory glance - hats off to us \*cue self back pats\*

But the real task lies ahead. There is something deeper and more organic underlying the entire meme culture and internet behavior in general, some-

thing that distinguishes what a meme is and at the same time connects all the memes into a single, giant, amalgamate that does way more than offer you your daily dose of humor. To truly grasp this idea, we have to go down the proverbial rabbit hole.



**MEME = GENE =  
VIRUS?**

While the analogy between memes and genes is

surely one that makes it easier to grasp the definition of the meme as given by Richard Dawkins, it is not entirely true, or rather, it is not the entire truth. What

comes in handy, though, is an alternative line of thought in memetics - one that perceives the meme as a virus.

Don't reach out for your hand sanitizers and air purifiers just yet; this isn't a typical virus we are talking about. This isn't biological or computerised, at least not in itself. So why do we need to think about it this way? First of all, subscribing to the gene theory is prone to a couple of misconceptions. First, genes don't spread only through replication. In fact, it is the repeated errors that introduce mutation - a key factor in evolution, the reason you and I exist. A simple exercise in observation and thought tells us that a meme actually exists because

of transformation or manipulation of a base idea before it is spread - even if the manipulation is nothing more than the addition of one's opinion to the idea (Case in point - almost no two meme images that you see online are the same, even if they are based on the exact same meme). Genes mostly replicate unaltered, with a modification or mutation creeping in as a rarity. Memes mutate more frequently. It makes more sense to understand that like the process of evolution with genes, memes actually mutate in majority, and in this mutation lies the key to an evolved, persistent 'fit' meme that survives.

While showing why a meme is mostly like a gene is a step in the right direction, it doesn't get you all the way. A similarity between memes and viruses lies in the way that it behaves with you - the individual, the consumer, the reader. A typical parasite needs a conducive medium to spread - you usually do not catch a cold in the middle of the summer or contract a deadly virus in a squeaky clean locality. And never before has there been a more suitable environment for the spread of ideas than the internet. But even before that, ideas always had their own ways of getting spread around - be it through libraries, public gatherings, entertainment media and more.

A typical virus enters your body, reacts with it, attacks it or alters it, and either gets rejected and quarantined or accepted and forwarded. Just like that, an idea, once it reaches the end point of your mind, either persists there or gets dismissed. In the case of the former, you become the host to that idea, comprehending and interpreting it, in turn changing your own understanding of it. In the end, it is you, the host, that is affected by the idea while the idea still lies out there in its initial 'unaffected-by-you' form and also in your own variation of it, in either case looking at being spread further - as Daniel Dennett wonderfully said, "a scholar is a library's way of making another library".



### THE UNKNOWN THREADS?

We cannot get away with establishing that a meme is like a

virus and then not explaining how it can behave. Since, undoubtedly, there are specific, underlying rules that govern it and, in turn, you. While not exhaustive, there are some maxims that have been identified which shed some light on this - collectively sometimes referred to as the rules of the internet. Memes create stereotypes, stereotypes create the memes and so on it goes. Just like genes, it is not possible to comprehend the characteristics of a meme in isolation. Genes usually have phenotypic effects in the presence of other genes. Similarly memes spread in the presence of certain favorable behaviour patterns. And to understand these patterns, one needs to look at the underlying rules mentioned earlier. Keep in mind though, that these rules represent a small part of a much larger system of maxims constantly being modified and updated to reach absolute ideas, so what appears funny to you today, might be a grave and serious truth tomorrow. But for today, these memes inform you of numerous stereotypes and go on to point out how they ideally behave. For instance:

- 'Forever alone' is an ironically sad person and if you behave a certain way/do a certain thing, you're one;
- Trolling is humor, and you're kind of an uptight jerk if you take it seriously and more;

Don't get us wrong - stereotypes have always existed. But things work a bit differently when they are spread on the internet. Urban legends have always been a meme, but they are now spread to way more people with access to the internet and receive much more credibility thanks to technology aiding false evidence. For example, Slenderman was a fictional creature created for an online contest in 2009, the mythos of which was further expanded in the years to come. After reading a creepypasta (which itself is simply 'creepy' stories copied and 'pasted' all over the internet) about him, two 12 year olds in Waukesha, Wisconsin stabbed a third one 19 times to appease the fictional creature and keep their families safe from him. The girl barely survived and the trial

is still ongoing. And this was a faceless man who had tentacles coming out of his back.

If you're pondering on why they would do that, the 1% rule of the internet in combination with Poe's law (both being part of the maxims that were referred to earlier, mentioned in separate box) makes it much easier to understand that a fake idea, no matter how outrageous it might be, if presented well on the internet (i.e without the obvious disclaimers that Poe's law specifies) might just be perceived as gospel truth. If you use a meme to describe a person repeatedly, at one point of time there will be people who would have formed that opinion about that very person, without verification. But you don't have to reach out to a lesser known case to see this in action.



### WHAT IF I TOLD YOU THAT IT ACTUALLY WORKS?

We've all heard the statement 'Don't feed the trolls', or one of its modifications (once again, a meme) and have generally accepted it as the right course of action against the spreading of obvious misinformation or plainly stupid arguments - for example, comparison to Nazis as outlined in Godwin's law. But this has led to a very interesting phenomenon that has impacted one of the most important



Without memes, there might have been a completely different person in the oval office right now



events in recent times - the 2016 Presidential Election.

The general consensus (online) about the alt-right (or conservatives or whatever you might call the side that won) was that their arguments are silly, baseless and easily seen through A.K.A trolling. Hence the widespread reaction to those very arguments was outright dismissal. But not doing anything about that eventually led to the general populace of the country into believing the satire-laden trolling to be genuine facts in most cases. Just like how Facebook's fake news problem, triggered by switching trending topics to a purely algorithmic process from human curation, was unable to distinguish baseless trends from genuine news and ended up influencing a lot of people. If this does not instate the validity of Poe's law, we don't know what will.

On the other hand, outright denial or declaration of your victory online also loses you any argument that you might involved in because of the exact same reasons. Danth's law (see box) comes into action more often than you think it does, and if you stay behind to check whether your declaration has been accepted by others in the argument or not, even after you've declared you're leaving, you'd be fulfilling Shaker's law. Still believe that there isn't an unseen set of rules that govern the memes, and your, behaviour?



### **MEME - THE UNIVERSAL TOOL**

While most of our mental schema is wired to keep us focussed and occupied with what's at hand, memes, with their inherent imageability and repetitive nature, help us process abstractions faster. While this is beneficial, abstraction also leads to an unavoidable problem: we begin to view memes as concrete units, where they are not. This is what lets us be able to wage an actual war against an abstract idea ('terrorism') or a particular class of chemical compounds ('drugs'). This leads to belief systems that are not entirely robust against questioning or dire situations, in which we unconsciously propagate

## THE RULES OF THE INTERNET

While some of the maxims that apply to the internet have been mentioned in the article, here is an expanded list of what we believe to be the governing rules of online behavior:

### **BADGER'S LAW**

Websites with the word "Truth" in the URL have none in the posted content.

### **DANTH'S LAW**

If you have to insist that you've won an Internet argument, you've probably lost badly.

### **GODWIN'S LAW**

As an online discussion grows longer, the probability of a comparison involving Hitler approaches 1

### **POE'S LAW**

Without a clear indication of the author's intent, it is difficult or impossible to tell the difference between an expression of sincere extremism and a parody of extremism.

### **RULE 34**

If it exists, there's porn of it

### **SKITT'S LAW**

Any post correcting an error in another post will contain at least one error itself

### **LAW OF EXCLAMATION**

The more exclamation points used in an email (or other posting), the more likely it is a complete lie. This is also true for excessive capital letters.

### **COHEN'S LAW**

Whoever resorts to the argument

"whoever resorts to the argument that... has automatically lost the debate" has automatically lost the debate.

### **SHAKER'S LAW**

Those who egregiously announce their imminent departure from an Internet discussion forum almost never actually leave.

### **SKARKA'S LAW**

On internet messageboards, there is no subject so vile or indefensible that someone won't post positively/in defense of it.

### **SHANK'S LAW**

The imaginative powers of the human mind have yet to rise to the challenge of concocting a conspiracy theory so batshit insane that one cannot find at least one Ph.D holding scientist to support it.

### **WIO'S LAW**

Communication usually fails, except by accident

### **STURGEON'S LAW**

90% of everything is crap

### **THE 1% RULE**

The 1% rule states that the number of people who create content on the Internet represents approximately 1% of the people actually viewing that content.

### **CUNNINGHAM'S LAW**

The best way to get the right answer on the Internet is not to ask a question, it's to post the wrong answer.

those very memes. And generally, these are simple, catchy, easy-to-grasp ideas - just because they are easier to retain and rehearse.

Acknowledging the meme in its true form - as a connected pseudo-organism that influences individual, and in turn, social behaviour can be more beneficial than you think. As an analogy, the first step you take against a virus outbreak is acknowledge that there is an outbreak. It's just that in

this case, the outbreak can be controlled to influence certain people in certain ways. And these unseen rules, which perhaps now you'll be more perceptive to, benefit the understanding, hence predictability, of how memes behave. This underlying system, this blueprint to the organism that now lies on the fringes of awareness when it comes to the general populace, will someday be viewed as what shaped the world as we will know it. **d**

# 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 घटनाओं 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 भाषाओं में उपलब्ध होगा।

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डिजिट



# LIFE AS A MEME

## BECOMING A MEME HAS ITS CONSEQUENCES

ARNAB MUKHERJEE  
arnab@digit.in

**M**any memes hijack the portraits or videos of real people. How do these people end up feeling about the unexpected infamy? Well, let's find out.

### BADASS

Neil DeGrasse Tyson admitted that he was initially creeped out by the badass meme. But he eventually came around, deciding it was flattering rather than mocking. He also reiterates the origin of the much copy-and-pasted gesture,



which sprang from a video he did about Isaac Newton, who was, in fairness, a badass. As told to JT from The Verge.

### OAG

Overly Attached Girlfriend star Laina actually took to her fame quite well and started her own YouTube channel. "Part of me wondered if I was supposed to just perform this character forever," she said. "Even



now, I wonder if I should have created two separate accounts for my own videos vs. Overly-Attached Girlfriend", Liana told Vanessa Brown,

news.com.au. Currently, her YouTube account has a whopping 1,288,328 subscribers, and Laina said a lot of people still see her as the girl with the creepy face.

### SAD KEANU

Keanu Reeves is well aware of his Sad Keanu meme and his official response: "I mean, do I wish I didn't get my picture taken while I was eating a sandwich on the streets of New York? Yeah." As told to BBC.



### COLLEGE FRESHMAN

In a reddit AMA, College Freshman meme star Griffin Kirtsy admitted that many of the memes mimicked his first year of college, saying "the laundry jokes, the bragging about parties I went to, and all of the dying ones happened to me." He also reports that being a meme hasn't had any real negative effects on his life: "I plan on being the College Freshman until ... I die."



### SUBURBAN MOM

When someone explained to her that her image was used to make jokes about uptight, hypocritical, and


sometimes racist suburban mothers, Philips says her initial reaction was "horror and fury and hurt." After she was told that the joke wasn't about her, but about overly protective moms who don't practice what they preach, Philips said she felt a bit better about the whole thing. "I never want anyone who sees it to think that I, the real mom/person ... believes any of that stuff, especially the derogatory, inflammatory, prejudiced things in there." As told to the Daily Dot



### RIDICULOUSLY PHOTOGENIC GUY

In an interview with American breakfast television show Good Morning America, Zeddie Little responded to questions about his meme appeal, "I really don't know, but I kinda feel honoured to be part of a joke that's in good spirit because sometimes the Internet can be a little vicious or jokes can get bent the wrong way. But these are all kind, and for the most part,



positive. It's funny that everybody has kinda taken a like to it. It's, I guess, the most flattering way to get spread across the Internet." 



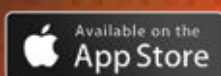
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# worldview

OUR PICK OF THE BEST TECH ARTICLES FROM AROUND THE GLOBE

## (MUST READS)



### APPLE'S GREAT DESIGN MYTH

The tech giant's new space-ship-like headquarters may look beautiful on the surface, but it's what's underneath that's so shocking.

<http://dgit.in/MythApple>

### IS SILICON VALLEY DOWNGRADING?

Awestruck visions of the tech industry have become harder to believe. Even Silicon Valley, the world's best known



home for startups and global technology companies, has become less convincing.

<http://dgit.in/TechDegrade>

### THE NEXT BIG BLUE-COLLAR JOB

As the world keeps growing and the demand for skilled coders keep rising, what if we regard code as not a very high-stakes job? Coding could very well be the next big blue-collar job.

<http://dgit.in/BlueCode>

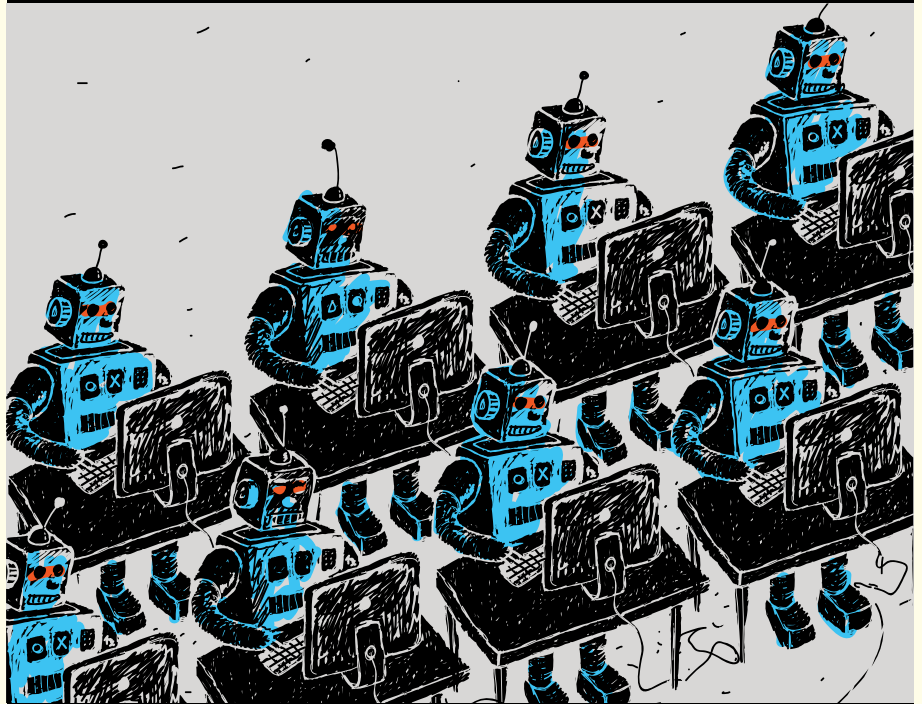
### INTERNET IS MOSTLY BOTS

More than fifty percent of web traffic comes from automated programs - many of which are malicious, according to a report.

<http://dgit.in/AllBots>

## [Wired Corner]

### IS AI REALLY THREATENING THE END OF THE MIDDLE CLASS?



The world's top artificial intelligence researchers met up to talk about their research and the role it plays in the fate of humanity. And interestingly, the current AI threat isn't the next SKYNET, but the end of the middle class. <http://dgit.in/Alreal>

Interactive page



#### Guide to digital privacy

The issue of privacy rights in regards to digital devices, especially when travelling abroad are still undefined. That's quite troubling. Here is an expert's guide on how you can minimize data invasion and get past security customs with all your digital privacy intact.

<http://dgit.in/Dprivacy>



#### Studying Earth change

A pair of scientist believe that they have an equation that can calculate and pinpoint the year that Anthropocene - the period when human activity became the dominant influence on climate/environment - first began and how it is changing the Earth forever.

<http://dgit.in/Earthchange>



#### Trick to learning faster

In an age where people are exposed to more and more information everyday, if want to absorb and learn more skills faster, the trick is to overclock your audio and video. After all, skimming was the original way people dealt with the info boom. Here's how-

<http://dgit.in/AVskills>



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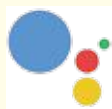
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**ARE VPNS REALLY SAFE?**

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# Wear me not: is the era of fitness trackers and smartwatches nearing its end?



The numbers aren't looking good, neither is the state of some of the key players in the wearables industry.

– By Adamyia Sharma

Fitbit laid off 6% of its workforce. Pebble shut shop. Jawbone is reportedly planning to exit the wearable space and enter the medical tech arena. Misfit handed over its business to Fossil way back in 2015. The wearable world is stagnant and in a downward spiral. Will it stand the test of time? Are you still using that smart-watch you picked up 6 months ago? Are fitness trackers purely riding on a novelty factor? Do we really need another device to charge? Let's try to answer these, and other pertinent questions.

**Why are we buying wearables in India?**

To say that wearables do not attract the same enthusiasm as smartphones would be an understatement, at least in the 'developing market' we live in. However, market reports will tell you that Indians are still stocking up on wearables. According to a report by the International Data Corporation, wearables clocked just over 400,000 units in the first quarter of 2016. They continued their successful streak through to the second quarter of 2016, with a jump of 41.9 percent over the previous quarter.



Chinese manufacturer Xiaomi led the rally of wearable shipments in India for the first quarter. Native GOQii took the title away in the second quarter. Fitbit sat comfortably in the third spot through both quarters.

While a robust growth trajectory looks good on paper for the wearables industry in India, it may not remain in the green for long. The same IDC report goes to show that Indians are more likely to buy basic activity trackers, instead of smart wearables that run third-party apps such as the Apple Watch or the Samsung Gear S3. Here in India, it all comes down to price and novelty. While the latter may also be a factor that influences wearables' purchases in countries like the US and UK, price sensitivity is,



and has been, a crucial deciding factor for Indians. A ₹1,999 Mi Band 2 is any day more attractive to the Indian buyer than a ₹14,999 FitBit Charge 2 or a ₹32,900 Apple Watch 2. In fact, almost 94% of wearables accounted for in IDC's Q2 2016 numbers account for 'basic bands and trackers'. "The average price of over \$190 has had a negative impact on smart wearables (smartwatches and such) as it is still perceived as a premium device which not many consumers can afford," Raj Nimesh, Senior Market Analyst - Client Devices, IDC, writes in the report.

A new toy to play with, or as we called it earlier, novelty, is the second factor that influences wearables' purchases in India. That, coupled with an affordable price tag, is a recipe for success that many

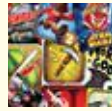
## HISTORY OF DARK MATTER



The hunt for a dark matter particle has been on for decades.

Humanity still hasn't produced a clear answer. Is it just in our imaginations or are they real? No definitive answer, but the search has gotten more interesting since the 19th century. <http://dgit.in/Hdarkmatter>

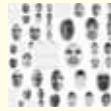
## A TAKE ON APPS AND ADS



Get your favourite mobile apps for free and watch annoying ads

in return - This may sound like a fair trade, but the real trade-off isn't really ads for apps - it's intrusive mobile surveillance. Mobile apps collect a massive amount of personal data <http://dgit.in/AppsAds>

## CAN AI TURN RACIST?



Algorithmic bias can sometimes turn bots into beasts. Working

on a new product or feature launch? If you're not sure whether algorithmic bias could derail your plan, you should be. Here's a guide on how you can keep your AI from turning into a racist monster. <http://dgit.in/racistAI>

## WORLD'S MOST SECRETIVE STARTUP



From magical goggles, to robotic drones, to human-sized robots, the

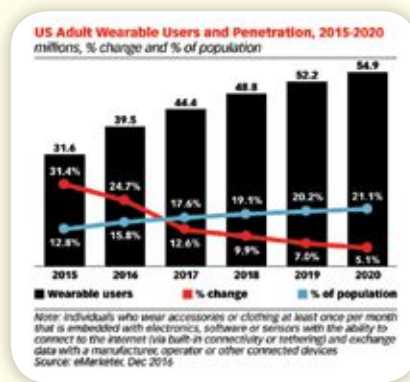
world's hottest startup isn't located in Silicon Valley—it's in suburban Florida. Magic Leap's mind-bending technology tells us about its quest to create a new kind of reality. <http://dgit.in/MagicLeapW>

wearable sellers like Xiaomi and Huawei have adopted in India. GOQii, India's largest wearables vendor by market share, takes a different approach by selling subscriptions instead of devices. The cheapest, 3 month subscription for GOQii services, including a fitness band and real-life health consultations starts at ₹1,999.

## Why are they not buying wearables abroad?

In markets that are not driven by price, wearables had a real opportunity to make a difference. However, they have failed to do so. Every now and then Apple launches a watch or Samsung releases a new Gear device, to create some 'buzz' in the market. A market, which for long, has been hoisting red flags for wearable makers. Since 2014, the western world has made its lack of commitment to wearables very apparent. An Endeavour Partners' survey from circa 2014 claimed that 50% of wearables' users had a tendency to dump their devices. As per the report, "The wearables that are very successful are the ones that are designed to solve a very specific problem for someone that a smartphone isn't doing."

Come 2016, a Gartner report remains almost unchanged. According to the findings of the report, the abandonment rate of smartwatches is 29%, and that of fitness trackers is 30%. "The abandonment rate is quite high relative to the usage rate. To offer a compelling enough value proposition, the uses for wearable devices need to be distinct from what smartphones typically provide. Wearables makers need to engage users with incentives and gamification," stated the report.



In this two year period, smartwatches and fitness trackers became smarter, added more sensors, and heightened their appeal. But they still haven't hit the sweet spot with consumers. A study by Strategy Analytics points out that global smartwatch shipments grew by as low as 1% annually, from 8.1 million units in Q4 2015 to 8.2 million in Q4 2016. This, after two consecutive quarters of declining volumes. Another report by eMarketer shows the dire penetration of wearable devices in the US.

"Without a clear use case for smart watches — which have more features than fitness trackers, but significant overlap with smartphone functionality — the more sophisticated, expensive devices have not caught on as quickly as expected," said eMarketer analyst Nicole Perrin in the report.

## The Silver Lining

After years of playing the same record, there is one good thing that seems to have come from the wearables space - medical wearables. Why? Because they actually have some utility to offer. In some cases, this could be monitoring long term ill-

nesses, or in others, reminding patients to take their medicines on time, or help a paralysed man feel touch, or even help calm down patients who suffer from panic attacks. Medical wearables have the ability to actually make a difference for their users, as opposed to trackers and smartwatches that bombard people with data they cannot interpret or trust. As per a study carried out by researchers at the University of Pittsburgh, fitness trackers don't actually help people reduce weight and become fitter. Another one published in Lancet Diabetes and Endocrinology, states that while fitness trackers and smartwatches do increase activity levels in people, it is not enough to battle chronic illnesses.

In conclusion, it is safe to say that the days for wearables as we know them now, are numbered. The future belongs to wearables that can do more than just replicate smartphone tasks. Wearables that can truly engage users, assist them



in achieving tasks that they otherwise cannot using a smartphone. Competition for wearables has presented itself in the form of VR/AR headsets, virtual assistants and IoT devices, all of which present stronger use-case scenarios even at their nascent stages.

<http://dgit.in/wearMeNot>

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## (PRODUCT LAUNCHES)

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**Price:** ₹2,999/-

### HTC 10 EVO



The handset offers a 5.5-inch Quad HD display, Snapdragon 810 processor, 3GB RAM and 32GB storage. The smartphone is IP57 water and dust resistant and will be available from the company's e-store.

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### 'DIY' a helicopter

**Duration:** 14:06

Here is a Do-It-Yourself video tutorial building a miniature helicopter. Does it fly? No. But it's kinda cool anyway.

<http://dgit.in/DIYchopper>



### Force stop and clear cache

**Duration:** 05:46

You usually “Force Stop” and “Clear Cache” when you have app troubles on your phone. But why does that help?

<http://dgit.in/FSnCS>





# Scraping Websites with Scrapy

>>If you find yourself frequently copy-pasting data you need from a website, scraping is the solution you were really looking for.> by Kshitij Sobti

Often websites with useful and important information provide no way to access that raw data, whether as a spreadsheet, or other kind of data dump or an API. Copy-pasting the data you need is always an option – and probably the better option if there is very little data – but when it comes to hundreds or thousands of pages, it's better to seek an automated solution.

Scraping is the process of programmatically fetching web content and extracting structured data from it. This process can be complicated by the fact that the data is often deeply nested in HTML, or sometimes loaded externally via JavaScript, and often is not in a directly-consumable form.

The challenge then is in discovering where the data is located online and writing code that extracts the data, filters out junk, and cleans the data before saving it. Any time the website undergoes a redesign, your code is likely to break, and you'll probably need to rewrite some of it, if not all of your code.

This is where frameworks like Scrapy come in. In this article we will build a scraper using Scrapy to get basic information about trending repositories on GitHub. Here, we use scraping just for learning purposes since GitHub has an API you should be using instead.

## What is Scrapy

Scrapy is a web scraping framework written in Python. It is open-source, modular, and simplifies routine tasks related to scraping websites. It helps you structure your code around a workflow that's easy to understand.



The core part of any Scrapy project is a Spider. Scrapy starts from an initial set of pages to fetch what the Spider provides, and then continues to fetch more URLs that the Spider keeps sending it. The fetched content is sent to the Spider itself, which

## \*Coding Matters



### \*80% powered by PHP

>> About 80% of the web is powered by PHP, but 90% of PHP websites still run on an older PHP5.

<http://dgit.in/80prentPHP>



### \*10 Python resources

>> If you've been planning to learn Python, here are 10 resources to help you get started.

<http://dgit.in/PyLrn>



### \*18 CSS Frameworks

>> Responsive design for websites is crucial so here are 18 CSS frameworks you should check out.

<http://dgit.in/18MobCSSFrmwrk>

then extracts structured data from the raw HTML and returns it back to Scrapy.

To help the spiders extract data from web pages with minimal code required, Scrapy provides what it calls **selectors**. The CSS selector for instance let's you select data from an HTML page using the CSS selectors you'd use in stylesheets or in jQuery. Another option is to use XPATH, a powerful syntax for navigating XML data.

When you're done scraping, you can optionally structure your data even better by using Scrapy as an **Item** class. If you are scraping multiple kinds of data from one or more spiders this can be quite useful.

For cleaning data, Scrapy has Item Pipelines. This code is sent as an item, and after operating on its contents it can return a cleaned item or even simply discard the item if it is invalid or otherwise useless.

### Setting up a Scrapy project

Now that we have some idea about how a Scrapy project works, let's create our own, and write our first Spider. Let's begin by first installing Scrapy.

Scrapy is written in Python, so you need Python installed on your system to continue. You can get Python from python.org and we recommend you download the latest release of Python 3. Scrapy can also work with Python 2 if you already have it installed.

After Python is installed, installing Scrapy can be done via:

```
pip install --user scrapy==1.3
```

This will install Scrapy 1.3 which is the latest as of this writing. The `--user` option will ensure that Scrapy and its dependencies are installed for your own user account and don't interfere with the rest of your system.

Installing Scrapy gives you access to the `scrapy` command that can be used to set up new Scrapy projects. Let's create a project called 'github' with the `startproject` command:

```
scrapy startproject github
```

This command creates the Scrapy project structure in a folder called github. We can run the `genspider` command in the project directory to create a new spider.

```
cd github
```

```
scrapy genspider trending github.com
```

This creates a spider called 'trending' that will scrape pages from the `github.com` domain. This will create a file called `trending.py` in the spiders directory of our project. There is nothing special about the `genspider` command; if you follow the format you can create this file manually.

### The Scrapy Shell

Before writing any code, it's always best to inspect the code of website you want to scrape, to look at how content is structured and how the data you want is nested within the HTML.

The Scrapy shell is a powerful environment to test and play with a website before you begin coding your actual scraper. It lets you run the kinds of commands you would run in a spider live in a REPL so you can look before you leap.

Here is how you can open the GitHub trending page in the shell:

```
scrapy shell https://www.github.com/trending
```

Scrapy will fetch this webpage, store it in a variable called `response` and give you tools to play with that data in an Python REPL. If you run the above command, right now though, you will get an empty response because GitHub signals to bots that they are disallowed from accessing the website.

These instructions are present in a `robots.txt` file on the website root, and tell responsible crawlers how to crawl the website. GitHub doesn't expect people to be crawling their website since they already provide an API for all their needs. For this learning exercise, we will tell Scrapy to ignore the `robots.txt` file.

Quit the shell by typing `quit()` or pressing `Ctrl-d` and edit the `settings.py` file in the project directory. Here you will notice a line that says `ROBOTSTXT_OBEY = True` set this to `False`. While this file is open, have a look at the options available. There is a lot you can configure such as concurrent requests, delays, cookies, headers, throttling etc.

Now rerun the `scrapy shell` command as mentioned above and you will see that the response variable is no longer empty. Now we can use those selectors to get to the content inside the page using CSS:

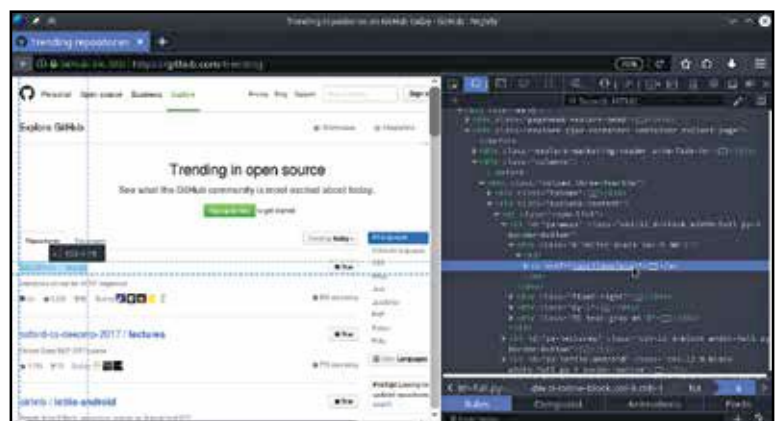
```
response.selector.css('h1').extract()
```

Here, we are using the CSS selector on the response and asking it to return all the h1 elements on the page (usually there is just one). The selector just makes a selection, and the `extract()` after that tells the selector to return the matched content as strings in a list. Here is what you should see:

```
['<h1>\n  <a class="pagehead-heading" href="/\n  explore">\n    Explore GitHub\n  </a>\n  </h1>']
```

As you can see, the h1 tag is inside it, now we know we need to go deeper. Instead of selecting `h1` we can select `h1>a` which selects an element directly inside an `h1` element. This will give us a tag, but what we really want is the title, the text that's actually inside the tag, not the tag itself.

While this is something you'd never need in regular CSS, Scrapy provides a syntax for that as well. Whenever you want the text content inside a tag, but not the tag itself, you can append `::text` at the end of your selector. If you want an attribute of the tag, you can use `::attr(...)`. For instance, to get



Exploring the structure of the GitHub trending repositories page to see how to write selectors for the bits we want.

the URL the anchor points to, you can use `::attr(href)`.

Let's see the interaction with the scrapy shell when we try our new selectors:

```
>>> response.selector.css('h1>a::text').
extract()
['\n Explore GitHub\n ']
```

```
>>> response.selector.css('h1>a::attr(href)').
extract()
['/explore']
```

We can see that we are now getting the heading of the page, plus some extra whitespace. We are also getting the URL that the heading points to.

While we just used CSS here to select content, in reality the selectors are being translated to XPath. We can also use XPath directly when that makes more sense. You can accomplish the same extract of the page heading using XPath as follows:

```
>>> response.selector.xpath('//h1/a/text()').
extract()
['\n Explore GitHub\n ']
```

```
>>> response.selector.xpath('//h1/a/@
href').extract()
['/explore']
```

XPath is almost like a file path, where `h1/a` means the `a` tag inside the `h1` tag. The double-slash in the beginning tells it to search for all `h1` tags. Finally `text()` returns the text inside a node and `@attr` returns at attribute names `attr`. We won't go any deeper into XPath in this article, but it is worth learning if you're interested in scraping. Even with the knowledge of XPath you should prefer the CSS syntax when dealing with things like CSS classes since the XPath alternative to that is quite complex.

Scrapy also includes a reselector that uses regular expressions, which you can use to extract parts of your final selection.

A very powerful and useful feature of selectors is that they can be chained. For instance you can use a selector to match a table, store that in a variable (without using `extract`) and then further apply selectors to that subsection of the selection.

You can keep using the shell to explore the page, but it can be hard to get to the relevant content through blind exploration. It's wise to open a browser in parallel, and use tools in the browser to see how the content is structured.

### Exploring using the Browser

The browser is a powerful tool to explore a page before you start scraping. You can use web inspection tools in most modern

## \*pointers

>>> Interesting Hubot developer videos



### \*Scraping web pages

>>> Watch a simple tutorial about writing a crawler using Scrapy to scrape and parse a webpage.

<http://dgit.in/WebScrapy>



### \*Scraping Reddit

>> Always wanted to extract the web content of Reddit? Here's a complete tutorial.

<http://dgit.in/ScrapingReddit>



### \*Scrapy Cloud

>>> Quick tutorial on how to deploy a Scrapy web crawler to the Scrapy Cloud platform.

<http://dgit.in/ScrapyCloud>



### \*Scrapy series

>>> A basic video tutorial series of using the Python Scrapy framework through the Windows command prompt.

<http://dgit.in/ScrapyTut>



browsers to know just what kind of selectors you can use to get to the data you want.

But beware, the HTML you see in the web inspector might not be what you see in Scrapy! Many modern websites use generous amounts of JavaScript to modify the web page after it is loaded, and these modifications will be absent in Scrapy since it just loads the page as text.

If you see a discrepancy between the browser tools and Scrapy, chances are the page's code was modified by JavaScript. If something is entirely missing from the page in Scrapy but present on the site, chances are it was loaded separately, and you might need to find out that URL and scrape that too.

Take advantage of the 'view source' functionality (usually `Ctrl+u`) to see the unaltered original HTML content of the page. You can also use `view(response)` in the shell to open the page as Scrapy sees it in a browser.

Start by exploring `https://github.com/` trending in your browser and try to figure out the selectors for yourself.

### Implementing our Scraper

Let's start with something simple, the Item class. It's open `items.py` and make sure the `GithubItem` class looks like this:

```
class GithubItem(scrapy.Item):
    repo = scrapy.Field()
    language = scrapy.Field()
    stars = scrapy.Field()
    forks = scrapy.Field()
```

Now let's open the `trending.py` file and have a look at our spider:

```
class TrendingSpider(scrapy.Spider):
    name = "trending"
    allowed_domains = ["github.com"]
    start_urls = ['https://github.com/
trending']
```

```
def parse(self, response):
    pass
```

The name here is a unique name for your scraper for command line usage. The `allowed_domains` restricts crawling to this domain, but if you want to enforce that you need to change some settings. Finally, `start_urls` gives Scrapy the URLs to start the scraping job with. Only the `name` here is required, instead of `start_urls` you can create a `start_requests` method that generates the starting requests dynamically.

When Scrapy runs your spider, it will fetch the URLs one by one and send the



result to the `parse` method. This is where all the magic will happen. This is where we will use our selectors to extract data and return it to Scrapy. Let's look at the completed `parse` method:

```
def parse(self, response):
    repos = response.selector.css('ol.repo-list li')
    for repo in repos:
        name = repo.xpath('://h3/a/@href').extract_first()
        lang = repo.css(
            'span[itemprop="programmingLanguage"]::text'
        ).extract()
        stars = repo.css(
            'a[aria-label="Stargazers"]::text'
        ).extract()
        forks = repo.xpath(
            '://a[@aria-label="Forks"]/text()'
        ).extract()
        yield GithubItem(
            repo=name,
            language=lang,
            stars=stars,
            forks=forks,
        )
```

Here we are making a selection of all the trending repositories and then extracting details from them one by one. After extracting the data, we are wrapping it into a `GithubItem` and yielding that. (You will need to add `from github.items import GithubItem` at top of the file to use `GithubItem`)

The difference between `return` and `yield` is something that often confuses people. Look at it as a way for a function to return multiple values, one by one as they are computed. The function can 'return' a value and keep running where it left off. It would be useful to read up about `yield` as it is a useful construct and has now been adopted by JavaScript as well.

If while scraping you discover another URL you want to scrape, you can yield a request (using `scrapy.Request(some_url)`) instead of an item Scrapy would automatically add that to the list of URLs to fetch.

Sometimes these URLs could be entirely tangential to your current scrape and require a different parsing strategy. In that case, you can provide the alternative parse function for Scrapy to use with that URL. Here is how you could tell Scrapy to use the `parse2` method to parse the data fetched from `some_url`: `yield scrapy.Request(some_url, callback=self.parse2)`

If you want the second parsing method to have access to the item so that it can add the data it scrapes to the existing item, you can do that as well, but you will need to explicitly include that in the request. Here is how you can do that:

```
yield scrapy.Request(details_url,
    callback=self.parse_details,
    meta={'item': item})
```

Here Scrapy will fetch the `details_url` and pass it to the `parse_details` method. In that method, we will be able to access the item data by accessing `response.meta['item']`.

You can now run this using the `scrapy crawl` command: `scrapy crawl trending -o trending.csv`

The above command instructs Scrapy to start scraping using the 'trending' spider; and the `-o` lets us specify the output file

name. Here the output will be in the CSV format based on the file extension. JSON and some other formats are also supported.

Note that Scrapy will not delete existing data if you run the command multiple times; new data will be added to the end. This might not be what you want.

If you open the CSV file now, you'll see that all the data we wanted is there, but it's a little messy with extra whitespaces. Let's use a pipeline to get rid of that.

### Adding a Pipeline

If you open `pipelines.py` you will find that Scrapy has already created a basic pipeline class for you. This class has a single method `process_item` that simply returns the item it gets as is. In this method we can add out logic to clean up the item. Here is our final pipeline class:

```
class GithubPipeline(object):
    def process_item(self, item, spider):
        item['language'] = " ".join(item['language']).strip()
        item['stars'] = " ".join(item['stars']).strip()
        item['forks'] = " ".join(item['forks']).strip()
        return item
```

Since `extract` returns a list of strings, here we just join those strings into a single string, and strip the whitespace padding. This could be done in the Spider, but pipelines are easier to reuse and often more complex than the example above.

Scrapy won't automatically use this pipeline, you'll need to enable it in `settings.py`. A section for that already exists, but is commented out. Uncomment the `ITEM_PIPELINES` declaration and change the name of the pipeline to match our pipeline name. It should look like this:

```
ITEM_PIPELINES = [
    'github.pipelines.GithubPipeline': 300,
]
```

The numerical value here is used to set the order in which pipelines are used, in case there is more than one. If you run the scraper now, you will find the output is cleaned up.

### Next Steps

There is a whole lot more you can do with Scrapy by taking advantage of more complex concepts like middleware (which allows extending the functionality of Scrapy), and signals (which notify you of scraping events). Just exploring the settings file should give you an idea of where you can go next.

You can also look into `scrapyd`, a Python package that turns your scraper into a web service so you can start crawls, check status of crawls and get crawl results using a web API. This can be useful to integrate the scraper with code in another language. ScrapyHub is a service that provides hosting for Scrapy spiders, and has a free tier.

The major task, no matter what tool you use for scraping will always be able to identify how and where the data you want it available, and how you can extract it. This is a skill that you can hone with practise as you encounter different kinds of websites that challenge you in different ways.

Your next step should be to check out the Scrapy documentation to learn many of the things we haven't covered here.

NOTE: You can find the complete code for this project on GitHub at: <http://dgit.in/WebScrpngDgt>

# It's a Robotlution



**Mithun Mohandas**  
Asst. Technical Editor  
[mithun@digit.in](mailto:mithun@digit.in)

**"The advancements over the last two years have had such profound impact on industries that you've had the greatest intellectuals of our generation worried."**

Artificial Intelligence has been on the top of my mind for a couple of months now. What started as research for an article has grown into something bordering on obsession. Every major software firm is pouring millions into AI research and the pace of innovation of late, has been a little exciting and at the same time a little disconcerting.


Just earlier this month there were these reports of a Chinese factory replacing 90 per cent of its workforce with robots. The Changying Precision Technology Company shunted almost everyone who worked on their assembly line and kept just 60 workers, a mere fraction of the 650 strong workforce it had previously. And the statistics reveal exactly why the company opted for such a move – a 250 per cent rise in production and 80 per cent drop in defects. If we are to go by industry statistics then the investment towards incorporating robots pay off really fast. However, there's something most news outlets didn't pay attention to – the news is roughly a year old. The robot revolution began quite a while back.

And it's not just this one company, MNCs have also begun exploring the use of AI and robots towards increasing their already large profit margins. Adidas recently announced that they'll be looking forward to making use of robots in their factories as well. There was even a rumour that McDonald's was looking forward to using robots as those end up being more economical in the longer run compared to minimum wage workers. Fortunately, that report turned out to be false. But before you heave a sigh of relief, do note that the robot revolution is going to work out in a similar fashion like the industrial revolution did in the early 1800s. A large portion of the labour force was rendered jobless and skilled labour was more in demand.

AI and robotics are doing the same to every field. The advancements over the last two years have had such profound impact on industries that you've had the greatest intellectuals of our generation worried. Yeah, Elon Musk and Stephen Hawking aren't wrong. If AI does indeed achieve a runaway effect then we'll all be out of jobs soon. Computers can code, computers can design, computers can encrypt and likewise, decrypt some of the strongest ciphers with ease. So much that the mode of encryption is no longer a barrier, rather it's the strength of

encryption that's hindering these machines. Or else we'd have botnets crunching away day and night breaking encryptions that hold your dearest secrets. Oh wait! They already do.

So should you be worried? Most certainly yes, but you do have time, plenty of time to add to your skillset so that you aren't rendered jobless in the next wave. After the unfortunate souls who'd made their living off of assembly lines, it will be those in the transportation industry who're going to lose their jobs. And shortly thereafter, anyone who's just relegated to number crunching will be replaced. As we speak, scientists are running experiments to figure out how bots pick and manipulate stocks. Apparently and obviously, they're way better than stockbrokers. Babak Hodjat, one of the key people behind Siri is working on an AI system which can monitor billions of data points, spot trends, learn patterns and predict market sway.

Given that Wall St. has quite a lot of lobbying power, it might try to shut down this system. And the same can be said for every other industry, unions and lobbies might try to put things to an end. However, if we are to sift through the history books then we know such attempts are always futile. Even us technology writers are at risk of being replaced by simple PHP applications. Autoblogging tools have been around for a while but they've always needed a source to rip-off. Soon enough they'll be able to monitor sources like press releases and autoblog an article faster than any human, and the web favours the first ones to break a story. So am I going to bring together all my brethren and unionise to postpone the inevitable? Nope, I'm going to start getting more into coding, hopefully I can write my own little bot. It's not going to happen anytime soon, we're still in a country where the print medium continues to grow in certain aspects, so we do have time. All I care about is that I don't end up as one of those who gets replaced by a bot. If at all I'm ever to be replaced, I might as well build my own replacement. I suggest you do the same. 

Let me know your thoughts on this column at: [@mithun\\_mohandas](https://twitter.com/mithun_mohandas)

# 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 53 ▶  
MSI GE62 7RE  
Apache Pro



◀ Page 54  
ZTE Blade A2 Plus



Page 55 ▶  
SteelSeries  
Apex M800



Page 56 ▲  
Vivo V5 Plus



▲ Page 57  
ASUS ROG GX700  
Gaming Laptop



▲ Page 58  
Coolpad Note 3S

& MORE...

**INTERACTIVE  
REVIEWS INSIDE!**  
KEEP AN EYE OUT FOR  
THE BLIPPAR ICON



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WITH IMAGE



BLIPP IMAGE  
INTO LIFE!





## 123 Cyber Criminals

The United States' FBI is currently trying to bring to justice about 123 people accused of cyber crimes. <http://dgit.in/FBIhunt>



## Android and iOS wins

According to some latest figures, 99.6% of new smartphones run either Android and iOS. R.I.p Windows & Blackberry <http://dgit.in/99DroidiOS>

**Bazaar**

# LG Signature OLED65E6P

For now the best TV money can buy.

Of all its high end televisions in India, LG's Signature OLED series is like the holy grail. LG see it as the *future of television*, and we agree. Its OLED panels set it apart, and at least until we get our hands on what Sony's been building, these TVs certainly reign supreme. The Signature OLED65E6T (which is the 65-inch model) is incidentally the only television in India to support both Dolby Vision and HDR. It may also be the best looking television out there. There is a non-detachable Harman Kardon soundbar attached at the bottom, but everything else is almost paper thin. The screen also has a ambient light filter on it, to avoid reflections. You'll know this is important once you see the TV's black levels, and the filter does a really good job of avoiding reflections, too. It's got all the ports you'd need (see the specifications for details) and they are all neatly tucked away behind the soundbar.

As far as picture quality is concerned, OLED panels currently enjoy a place of their own. The LG Signature OLED 65E6T delivers rich and natural colours, with deeper than deep blacks. The panel can turn off individual pixels, making black levels 0 for up to 50% brightness. Even beyond that, black levels rise only slightly. There's no motion blur to speak of but you'll need to turn off LG's TruMotion feature first.

What's truly exciting is its handling of 720p and 1080p content. The TV upscaled content exceptionally well. In fact, despite the blasphemy of playing 480p content, the quality is quite passable. Further, the LG Signature OLED65E6T shows little noise. You may be able to see some noise, most likely caused by dithering, on some content, but you'll need to be really close to the TV for that. Testing via our colorimeter, the TV returns black levels of 0 on 0%, 25% and 50% brightness. 84% and 86% of the NTSC and AdobeRGB colour gamuts are represented, respectively. This means skin tones or natural scenery look as natural as they can. If you manage to get your hands on some HDR content, that is where the TV really shines. While it does so well with black levels to begin with, HDR just takes it up a notch. With HDR, Samsung and Sony have set high standards, but the LG OLED beats them hands down.



**Price**  
₹5,77,900

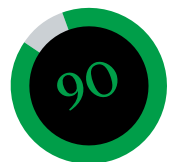
A problem with thin TVs like these and especially LG's OLEDs has been audio quality. We have noted low audio levels on its TVs earlier. However, the Harman Kardon soundbar solves that.

Audio is loud enough to fill large rooms and the bass is quite deep. However, audio quality isn't quite as detailed as the Sony X9350D television. Nevertheless, the OLED65E6T sounds good for regular TV viewing.

We can't complete this review without talking about the Magic Remote and WebOS. In our opinion, LG's Magic Remote is an excellent input device that basically replicates a computer mouse, with a cursor moving on screen. AndroidTV's touch-based remote is a little easier to get used to but this isn't bad either. While LG's WebOS performed as expected – fast and fluid – it still needs more apps. LG has added support for well known streaming apps, like Netflix, Amazon Prime and even the WWE Network, but the content store is still largely void of a lot of apps.

Our verdict? Well, the ₹5,77,900 price tag may look prohibitive. However, the LG Signature OLED65E6T is definitely the best television you can buy today. It beats the Sony Z9D, our Zero1 Awards winner for 2016, by a mile. It delivers unparalleled picture quality with decent audio to go with it. Sony's entry into the fray at this year's CES is welcome sign of things to come but in the meantime if you have the money this is what you should go for.

Prasid Banerjee



Performance.....87  
Design.....98  
Connectivity.....86

## Specifications

**Screen:** Ultra HD (3,840 x 2,160); **Speaker:** 2.2 Channel 40 W harman/kardon; **Ports:** HDMI 4 (HDCP 2.2), USB 3, Ethernet, Optical; **Other connectivity:** Wi-Fi 802/11 a/c, Wi-Fi Direct; **Dimensions:** 57.5x35.2x2.2-inches

## Contact

**LG India**  
**Phone:** 1800 315 9999  
**Email:** NA  
**Website:** [www.lg.com/in](http://www.lg.com/in)

**ZTE shutdown Kickstarter**

After about two months, ZTE is closing down their Hawkeye phone kickstarter due to insufficient funds. <http://dgit.in/HawkeyeZTE>

**Ms Office for Mac**

Microsoft releases an update for its Office suite that adds support for Apple's new MacBook Pro Touch Bar feature. <http://dgit.in/TouchMs>

# WD Green SSD 240 GB

Pales in comparison to the WD Blue



**T**he WD Green 240 GB SSD which is targeted at the budget segment.

Currently available with just two capacities, a 120 GB and 240 GB SKU.

Anything greater and it's unlikely that you'd want the controller that the WD Green comes with and you'll soon know why.

Unlike the WD Blue which had a Marvell 88SS1074 controller, the WD Green features a Silicon Motion SM2258XT which isn't that big a surprise. A glance at the PCB and we notice that the SM2258XT has a RAM-less design.

Both halves of the body are made of plastic with just metal inserts at the screw holes. The controller doesn't have any heatsink



Price  
₹8,320

or thermal pads attached to it. And even if it did, the body isn't made of metal to act as a heatsink. Here's where the power efficiency comes into play, as a controller which consumes less power isn't going to heat up as much.

We ran CrystalDiskMark before conditioning the SSDs and the sequential read speeds were at 540 MBps and write speeds were at 458 MBps. Compared to the WD Blue, the read speeds seem to be the same but the write speeds are 11.6 per cent lower.

We decided to compare the latency timings of the WD Green and the WD Blue. And the results are surprising. For something that costs just ₹1,200 lesser than the WD Blue, the WD Green sure has a large performance gap. The latency timings are roughly double that of the WD Blue and there's a large jump from 16QD onwards.

The WD Green 240 GB SSD suffers in comparison to its blue coloured cousin so we'd advise you to go for the WD Blue instead.

Mithun Mohandas



|                       |    |
|-----------------------|----|
| Performance.....      | 65 |
| Build .....           | 65 |
| Value for Money ..... | 86 |

**Specifications**

**Model:** WDS240G1G0A; **Form factor:** 2.5-inch; **Cost/GB:** ₹34.7; **Dimensions:** 100.5 x 69.9 x 7 mm; **Controller:** SM2258XT; SanDisk 15 nm TLC; **Warranty:** 3 years

**Contact**

**WD**  
**Phone:** 1800-200-5789  
**Email:** Website form  
**Website:** [www.wdc.com](http://www.wdc.com)

# Asus Zenfone 3s Max

Lasts long, but not the best

**B**attery life and update frequency are two major issues plaguing Android smartphones today. Think of the long list of smartphones available, and you'll realise so few of them are on Nougat.

It is this problem that Asus is addressing with its newest device. The Asus Zenfone 3s Max has a 5000 mAh battery and comes with Android Nougat out-of-the-box. To its credit the phone returns an excellent PCMark battery score of over 14 hours. The Zenfone 3s Max is also above average in terms of idle battery drop, which is important for a phone that has to last long. It runs on Android Nougat, layered with a new version of Asus' ZenUI. It looks the same aesthetically

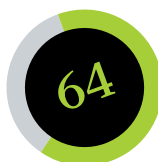


Price  
₹14,999

and frustrating as ever. On the performance front the Zenfone 3s Max is far from prodigious. It runs on the MediaTek MT6750T octa-core SoC and 3GB of RAM and its performance is not the best. You can check out the exact benchmark scores in our full review online but it's suffice to say that the phone is slow – whether it be gaming, fingerprint scanning, or even opening apps. Zenfone 3s Max's camera is decent, but it doesn't make for the best you can buy. With the right pricing, this camera may be acceptable, but phones like the Honor 6x beat it.

Overall the Asus Zenfone 3s Max is a decent battery-centric smartphone, and it does last long. However, at ₹14,999, the compromises make little sense. The Xiaomi Redmi Note 4 offers just an hour or so lesser battery life and gives you a better camera and performance.

Prasid Banerjee



|                  |    |
|------------------|----|
| Features.....    | 78 |
| Design .....     | 71 |
| Performance..... | 58 |
| Value .....      | 46 |

**Specifications**

**Screen:** 5.2-inch (720 x 1280) IPS PPI: 282; **Camera:** 13 MP rear; **Battery:** 5000 mAh; **SoC:** Mediatek MT6750 Octacore (1.5 GHz); **RAM:** 3GB; **GPU:** Mali T860; **Storage:** 32GB (upto 2TB); **Weight:** 175gms

**Contact**

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**Website:** [www.asus.in](http://www.asus.in)



## Problems in Auto apps

Researchers from Kaspersky Labs discover many security problems under the hood of connected car applications. <http://dgit.in/AutoSecure>



## Hospital uses VR

A hospital in the UK has developed a virtual reality app for kids to watch that ease the nerves before an MRI. <http://dgit.in/VRmedUK>

**Bazaar**

# MSI GE62 7RE Apache Pro

Blessed with the power of the 1050 Ti

**M**SI's lineup of gaming laptops covers a wide gamut when you think of how big the gaming segment is. The MSI range starts with the GL series and the hardware improves as you move up the line through the GP, GE, GS and lastly end up with the GT. We're looking at the MSI GE62 7RE Apache Pro which comes with the latest Kaby Lake processor on the 100-series platform.

Powered by an NVIDIA GTX 1050 Ti 4GB variant, this gaming laptop sits right in the middle of their spectrum offering users portability as well as good gaming performance.

## Build

Simple upgrades like a little extra RAM or swapping out the MXM graphics card are what every gamer would look for in a gaming laptop. The MSI GE62 7RE does allow you to upgrade the hard drive, SSD and the RAM easily as is the case with any laptop (except Macs, they're just a pain to work with). However, the CPU and the GPU on the GE62 7RE aren't upgradeable as these are BGA SKUs which are soldered onto the motherboard.

There are plenty of heat pipes for cooling with certain sections of the heatpipes helping cool down MOSFETs aside from the CPU and the GPU which require the most cooling.

The display panel isn't too thick as is the case with most gaming laptops and we didn't notice any irregularities with the hinges. The entire thing opens up quite side to a good 140 degrees.

We prefer chiclet style keys for gaming and would pick anything that has a higher greater travel distance. The Steelseries keyboard on MSI gaming laptops aren't lacking. As for the TouchPad, we aren't fond of the brushed metal finish. There are quite a few standard gestures that Windows 10 supports like two finger swipes for scrolling which can be a little finicky to perform on this TouchPad. Vertical swiping is absolutely effortless but horizontal swiping has an unusual feel to it.

The matte finish barely throws any glare and the colours seems to be quite accurate. The brightness was a little lower than mainstream laptops that we've tested coming in at around 220 cd/m2. Tone response wasn't out of the ordinary but colour uniformity and colour accuracy were quite high.



Price  
₹1,29,990

Overall, we'd say that the unit is pretty well designed and the lack of upgradeability is the only downside to the design.

## Performance

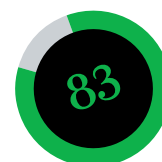
CineBench R15 scored 712 points in the CPU test and the laptop managed to crunch out 96.48 FPS in the OpenGL test. Even in PCMark, the GE62 7RE maintains a position in the top 1% of all the laptops we've tested with KabyLake CPUs.

We ran 3DMark Fire Strike a couple of times and averaged 7943 points. Unlike the GTX 1060, we don't get to see 60 FPS across all AAA titles. Instead, we're seeing more around the 40 FPS bracket. Rise of the Tomb Raider scored about 37.7 FPS, Witcher 3 with everything cranked up to max managed to scrape past with 25 FPS. At the end of the day, you will need to scale down a few of the parameters to get a smooth gameplay.

## Verdict

The MSI GE62 7RE is a simple refresh with Intel's latest KabyLake processors. Priced at ₹1,29,990 and powered by a Core i7 7700HQ and NVIDIA GTX 1050 Ti, it offers quite the value proposition for gamers. The display is great, and for a gaming laptop, it only weighs 2.4 kg which isn't exactly light weight but we don't see any better alternatives at the moment. Slight compromises are needed to get playable frame-rates but if you're on the lookout for a gaming laptop with a good balance between gaming performance and portability, then the MSI GE62 7RE is a pretty good option.

*Mithun Mohandas*



Performance..... 81  
Features .....86  
Build ..... 80

## Specifications

**Processor:** Intel Core i7 7700HQ; **Platform:** HM175; **RAM:** 16 GB 2400 MHz; **Screen Size:** 15.6-inches; **Screen Resolution:** 1920x1080; **GPU:** 1050 Ti 4 GB; **SSD:** 128GB; **HDD:** HGST 1 TB; **Ethernet:** Killer E2500; **Battery:** 6-Cell 51 Whr; **AC Adapter:** 150 W; **Weight:** 2.4 Kg

## Contact

**Acro Engineering Company**  
**Phone:** 011-40525645,  
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## Jed' is definitely plural!

Foreign titles reveal that the new upcoming Star Wars VIII: The Last Jedi will feature multiple Jedi(s). <http://digit.in/pluralJedi>



## New McLaren 720S

With the M840T 4.0 litre engine, the new supercar is expected to be capable of covering quarter mile in 10.3 seconds. <http://digit.in/720Smc>

# OWC Mercury Electra 6G MAX 1.92 TB SSD

A unique SSD value proposition



If you haven't heard of OWC, then you're forgiven. They've only

recently entered India and most of their product offerings are focused towards Apple's Macintosh computers. The OWC Mercury Electra 6G MAX 1.92 TB SSD is the largest capacity SSD that we've tested.

Since the OWC Mercury Electra 6G MAX 1.92 TB SSD is of a large capacity, we were excited to take a look inside. And what we noticed is a slightly different approach. There are eight NAND chips, two Silicon Motion SM2246EN controllers, two more RAM chips and a JMS562. That last chip is an eSATA Gen III bridge



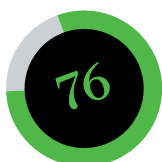
Price  
₹65,000

with support for RAID 0 and RAID 1. Yep, this SSD is basically two SSDs in RAID. Hence, the two Silicon Motion controllers instead of just one. We suspect that this might be the reason why the spec sheet mentions a lower IOPS figure as compared to what the controller is capable of individually.

In our tests, we got read speeds of 539 MBps and write speeds of 496 MBps. These speeds are quite good for SSDs connected to SATA III interface. The speeds for 512K, however, seem to be slightly on the lower side.

The Mercury Electra 6G MAX 1.92 TB SSD might have an older controller but it makes up for that by providing similar levels of performance as the newer drives. Certain IOPS heavy applications will get affected but then again there is little competition when you want to get a lot of space and that too on an SSD. With such a high capacity, the OWC Mercury Electra 6G MAX 1.92 TB caters to a demand that no other manufacturer does and that's one of the key reasons to get this drive.

Mithun Mohandas



|                       |    |
|-----------------------|----|
| Performance.....      | 62 |
| Build .....           | 80 |
| Value for Money ..... | 87 |

## Specifications

**Model:** OWCSSD7E6G02T; **Form factor:** 2.5-inch; **Cost/GB:** Rs. 34.7; **Dimensions:** 100.5 x 69.9 x 7 mm; **Controller:** SM2246en; **Warranty:** 3 years

## Contact

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**Phone:** 9560455706  
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# ZTE Blade A2 Plus

Decent battery, pedestrian everything else

The A2 Plus is the first of the ZTE Blade series phones to be launched in

India and quite unfortunately, it isn't ZTE's best work. It does support 4G VoLTE networks and has a few frills, but before getting into those let's focus on its forte – the battery. Between the Lenovo P2, Asus Zenfone 3s Max and ZTE Blade A2 Plus, the latter is the weakest. The device has a massive 5000 mAh battery that lasts just over 11 hours on PC Mark's Work 2.0 battery test. This test simulates real world performance by editing documents, playing videos, browsing etc. and keeping the screen turned on. It isn't the perfect test of real world battery life, but we've found



Price  
₹11,999

it to be closer than most other battery tests out there. As far as big battery phones go, this is 45 per cent lower than the Lenovo P2 and just about 10 per cent lower than the Asus Zenfone 3s Max. The Blade A2 Plus runs on the MediaTek MT6750 SoC, clocked at 1.5GHz. It is the same chipset that Asus used for its Zenfone 3s Max. However, this one doesn't run on Android Nougat and it has MiFavor 3.5 UI, instead of ZenUI. The performance, though, remains roughly the same. Perhaps the best thing about the Blade A2 Plus is its 5.5-inch 1080p display. You get 401 ppi pixel density with decently balanced colour reproduction. At the same time its weakest link is its camera. For its price (₹11,999) the battery performance is definitely good enough but you'll get a much more balanced smartphone in the Xiaomi Redmi Note 4.

Prasid Banerjee



|                   |    |
|-------------------|----|
| Features .....    | 81 |
| Design .....      | 70 |
| Performance ..... | 58 |
| Value .....       | 58 |

## Specifications

**Display:** 5.5-inch 1080p; **RAM:** 4 GB; **ROM:** 32 GB; **SoC:** 1.5 GHz MediaTek MT6750; **Battery:** 5000 mAh; **OS:** Android Marshmallow; **Camera:** 13 MP rear, 8 MP front

## Contact

**ZTE India**  
**Phone:** 1800-103-1900  
**Email:** NA  
**Website:** www.ztedevice.in



## Humans becoming Cyborgs

Elon Musk, the founder of Tesla and SpaceX says that over time, humans must become cyborgs in order to survive. <http://digit.in/ElonBot>



## Qualcomm's new IPQ8074

Chip maker Qualcomm announces two new chips compatible with the new 801.11ax. Will reduce WiFi congestion. <http://digit.in/IPQ8074>

Bazaar

# Seagate IronWolf 10 TB NAS Drive

Behold the behemoth



Performance.....72  
Build .....75  
Value for Money .....77

## Specifications

ST10000VN0004, Form factor: 3.5-inch; Cost/GB: Rs. 4.69; RPM: 7200; Dimensions: 26.11 x 101.85 x 146.99 mm; Cache: 256 MB; Avg. power: 6.8 W; Warranty: 3 years

## Contact

Fortune Marketing  
Phone: 011-26414468  
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Website: www.seagate.com

Seagate's rebranding exercise has resulted in their NAS drives being called IronWolf, SSHDs became FireCuda and Surveillance drives became Skyhawk. The Barracuda brand still exists for their normal desktop drives. Coming back to the IronWolf, Seagate has implemented a few NAS-focused technologies to improve reliability and reduce the harm from vibrations. The former is called AgileArray and the latter is called AccuTrack. These technologies come into play when the drives are configured in multi-bay systems. Since Seagate only sent us one drive, and the fact that these technologies can only be measured with a really large data



Price  
₹47,990

set, we couldn't say how big a difference these technologies bring to the table.

In our tests, 4K random read IOPS peaked at a little over 615 IOPS at 32QD and write IOPS were a little lower at 553. While in the same tests, the latency for read and write operations were around 52 and 56 milliseconds. We haven't tested such a high capacity drive before and the only thing we could compare it to were WD Red 4 TB drives. And these latency figures

were way better in comparison with the Red drives. The IronWolf is quiet even at high QD workloads which makes it quite the ideal drive for NAS devices.

Mithun Mobandas

# SteelSeries Apex M800

The best RGB lighting we've ever seen



Features.....74  
Build quality .....64  
Value .....60

It's been a long time since we saw a radical change in keyboards since the core technology hasn't changed for decades. They are either membrane keyboards or mechanical ones, and for a couple of years we've been witnessing hybrids coming up at affordable prices.

So is the Apex M800 enough for its ₹13,999 price tag with the exclusive switch design? The QSI switches are a new design for mechanical switches, exclusive to SteelSeries. Although it's a mechanical switch it still retains the feeling of a membrane keyboard. The low profile keys do seem ideal for FPS games only, but might not be advantageous to other game genres. It will also affect your typing and will take a lot of time to get used to the keys, as it did for us. Mechanical keyboards

are expensive because of their unique feedback given from the tactile and clicky switches. The new switch design brings along the best back-lighting we've ever seen in mechanical keyboards. They make the keys look brighter and the transitions are smooth.

The SteelSeries Engine receives frequent firmware upgrades and the macros and lighting effects can be easily controlled. The Apex M800 is directed to only gamers, especially FPS gamers expecting competitive performance from their keyboard. If you spend more of your time typing rather than gaming on your keyboard, then this definitely isn't something you should consider. Even though you have a healthy budget, we would still recommend you to experience the switches before you buy.

Abhijit Dey



Price  
₹13,999

## Specifications

Keyboard size: Standard, Numpad included, six macro keys; Keyboard backlighting: RGB LED; Switch type: Mechanical (SteelSeries QSI); Polling rate: 1,000 Hz (1 ms); Key-rollover: 256-key rollover; Interface: USB 2.0; Dimensions: 51 x 17.4 x 4.4 cm; Weight: 1.4 kg; Cable length: 2 m

## Contact

Amigo International  
Phone: NA  
Email: himanshu@amigointernational.biz  
Website: <http://www.steelseries.com>



## Young Supernova spotted

Observers catch a supernova just three hours after it explodes. The star might have shed a shell of material. <http://dgit.in/StarXplod>



## More security for WhatsApp

WhatsApp is finally rolling out two-step verification to all its users after testing the feature since last November. <http://dgit.in/WhatsAppU>

# Cooler Master MasterKeys Lite L Combo RGB

A worthy upgrade for the budget gamer



Price  
₹6,550

**T**he MasterKeys Lite L Combo is a great deal if you consider the price and what you get. At this price, you won't find an alternative to the keyboard with

RGB lighting. The lighting effects and quality are great but because of the non-transparent switches, the brightness is affected.

The mouse isn't impressive but it performs good enough without inaccuracies at low speeds. Even at high speeds, tracking accuracy is affected but the sensor doesn't spin out. Considering the mouse in this combo, it's a fair deal.

All the switches on the mouse give a good tactile feel while being comfortable for both grip styles. The right kind of switch is highly subjective since different people have their own preferences. If you've been used to regular flat or rubber dome membrane keyboards, the MasterKeys Lite L keyboard is definitely a worthy upgrade.

Whereas for the mouse, it definitely performs better than most of the mice selling at around ₹1,500. For this price we'd recommend get the MasterKeys Lite L Combo RGB

62

### MasterKeys Lite L Keyboard

Features .....60  
Build quality .....66  
Value .....75

52

### MasterKeys Lite L Mouse

Performance.....47  
Features .....36  
Build quality .....67  
Value .....59

### Contact

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Website: www.coolermaster.com

Abhijit Dey

# Vivo V5 Plus

For that Bokeh Selfie



**A**fter the fairly decent attempt at a selfie-centric smartphone with the V5, Vivo is taking another stab at the category, with a rather premium V5 Plus. The V5 Plus has a 20MP + 8MP camera at the front, which enables the phone to shoot better images in low light conditions, capturing more light and adding more details. The secondary 8 MP camera on the front helps the phone to take nice 'Bokeh' images.

However, the 16MP rear camera is not as good as the front camera. While the colour reproduction is accurate and the focus time is fairly decent, there is an observable lack of detail and the sharpness is also lower than the competition.



Price  
₹27,980

The V5 Plus is powered by a Qualcomm Snapdragon 625 SoC, which is paired with 4 GB of RAM. The phone remains snappy as far as non-intensive apps are concerned. Although, the app load times as well as the delay while switching between apps is considerably longer than the OnePlus 3T.

The 3160 mAh battery copes well and churns out a workday worth of battery life without much hassle.

Design wise, the Vivo V5 Plus looks and feels similar to most budget segment phones as all have a metal back, rounded edges and a front home button-cum-fingerprint scanner. All this gives it a iPhone-ish look. And the UI also looks very similar to Apple's iOS.

Overall, the Vivo V5 Plus is a good selfie-centric phone and that's pretty much it. Everything else about the phone is secondary and is overshadowed by the 3T.

Hardik Singh

66

Features .....76  
Performance.....53  
Value .....54  
Design .....84

### Specifications

SoC: Qualcomm Snapdragon 625;  
RAM: 4 GB; Internal Storage: 64GB; Display: 5.5-inch 1080p;  
OS: Android 6.0 Marshmallow;  
Battery: 3160 mAh

### Contact

Vivo India  
Phone: NA  
Email: www.vivo.co.in/  
ContactUs/  
Website: www.vivo.co.in





## A Venusian computer?

We may finally have a computer that can survive Venus' sulphuric rain, 500°C and 90 times Earth's pressure. <http://digit.in/VenusPC>



## Petition for Sony watch

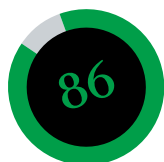
A new petition on change.org with more than 2,900 Sony SmartWatch 3 users signs for Android Wear 2.0. <http://digit.in/SonyWatch2>

**Bazaar**



# GIGABYTE AORUS GA-Z270X-Gaming 7

The sensible flagship



Features .....86  
Build .....85

## Specifications

**Chipset:** Intel Z270;  
**Memory support:** 4x4133 (OC) MHz upto 64 GB;  
**LAN:** 1x Killer E2500 + 1 Intel Gigabit Ethernet;  
**Audio:** ALC1220 7.1;  
**SATA:** 6x SATA III;  
**Expansion:** 3x PCIe X16 (x16+x8+x4); **Dimensions (LxWxD):** 305 x 264 mm;  
**Warranty:** 3 years.

## Contact

**GIGABYTE TECHNOLOGY**  
**Phone:** 022-40633222,  
**Email:** [sales@gigabyte.in](mailto:sales@gigabyte.in),  
**Website:** [www.gigabyte.in](http://www.gigabyte.in)

The GIGABYTE AORUS GA-Z270X-Gaming 7 is a slightly scaled down version of the GIGABYTE AORUS GA-Z270X-Gaming 9 in the sense that there are minor changes like the swapping of certain chips like one of the two Killer Ethernet ports getting replaced by an Intel GbE port. The major change is with the expansion ports which follow an x16+x8+x4 configuration compared to the x16+x16+x8+x8 configuration on the Gaming 9. The Gaming 9 had a lot of multiplexed PCIe lanes which the Gaming 7 doesn't. However, most of the features on the Gaming 9 were overkill. It had a no compromise approach and a beefy price tag.



Price  
₹28,500

The Gaming 7, on the other hand, with its reduced feature set has more of a mass appeal. Especially if you consider that the price tag is more reminiscent of Z170 flagships. It may not as many goodies as the Gaming 9 but there's no compromise on the performance front. There are ample amount of storage options and you can implement multi-GPU configurations so it's a high-end motherboard for KabyLake by all means. We noticed that the onboard Reset button and Clear CMOS button are a little too close to each other, they have different coloured keycaps but it's easy to accidentally press the wrong button and lose out on your overclocking run.

*Mithun Mobandas*

# ASUS ROG GX700

Water cooling on a laptop? Check!

With water cooling becoming more accessible to the common folk, it was only a matter of time before some brand came out with a water cooling laptop. That brand is ASUS, and the laptop is the GX700. It's not new by any means but the units only started selling in India last year and a newer GX800 has also announced as its successor. The water cooling on the GX700 is not a gimmick, there's a separate module just for that which ASUS calls the Hydro Overclocking System and the 330W power adapter plugs straight into the cooling module and the laptop draws power from the module. A separate power adapter is available for the laptop only but the

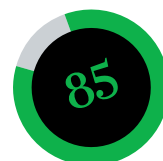
SKU we received didn't come with that. The mating of the two modules is simple and there's a metal latch to keep the unit from accidentally popping out.

Performance wise the 6820HQ on the GX700 is overclocked to 4.0 GHz which makes it perform better than newer KabyLake laptops with the Core i7 7700HQ. Moreover, the GTX 980 is also overclocked causing it to have a significant lead over competing laptops. Fire Strike score for the GX700 was 11390 which is quite high. Given the CPU and GPU performance, this water cooled laptop performs as well as high end desktops and for that reason the ASUS GX700 does have a premium price tag to match.

*Mithun Mobandas*



Price  
₹4,12,990



Performance .....84  
Features .....87  
Build .....85

## Specifications

**Processor:** Intel Core i7 6820HQ; **Platform:** CM236; **RAM:** 16 GB 2400 MHz DDR4; **Screen Size:** 17.3-inches; **Screen Resolution:** 3840x2160; **GPU:** GTX 980 8 GB; **SSD:** 2x 512 GB in RAID 0; **Ethernet:** Gigabit Ethernet; **Battery:** 6-Cell 93 Whr; **AC Adapter:** 330 W; **Weight:** 3.9 kg.

## Contact

**ASUS Technology**  
**Phone:** 18002090365  
**Email:** [reachus@asus.com](mailto:reachus@asus.com)  
**Website:** [www.asus.in/](http://www.asus.in/)



## Skype app update

Microsoft announces new features for its Skype application adding instant messaging and in-call reactions. <http://dgit.in/SkypeAp>



## NuAns ditches Windows

The eagerly awaited Windows phone from NuAns will actually be running Android. Read more to find out: <http://dgit.in/NuAnDroid>

# Cooler Master Devastator II

Strictly for tight budgets



Price  
₹4,550

Available in three colour variants, the Devastator II tries to capture the ₹3k segment by offering both a keyboard and mouse. The Devastator II combo doesn't

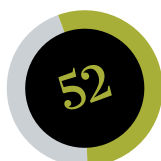
pack many features and the backlit colour only has an on and off setting that can be controlled with the Scroll Lock key. On the mouse, there's a DPI switch near the scroll wheel that lets you switch between three levels.

The entire chassis is made of plastic and is lightweight and does flex with force. The keycaps didn't seem to have a snug fit with the switches. They are definitely louder than membrane keyboards and feel closer to Cherry MX Blacks even though their actuation force is the same as Reds.

Typing was a little difficult in the default setting. The wrist rest isn't large enough to comfortably place your hands. Although this didn't hamper our typing speed, it definitely should have been more comfortable.

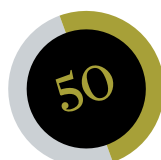
Considering the below average performance of the mouse and low feature set on the keyboard, we wouldn't recommend this combo. If you're stuck with a tighter budget, then you should go for the Zebtronics Max for the keyboard. For the mouse, if you're keen on getting a Cooler Master mouse, then go for the MasterMouse Lite S.

Abhijit Dey



### Devastator II Keyboard

|                     |    |
|---------------------|----|
| Features .....      | 50 |
| Build quality ..... | 56 |
| Value .....         | 78 |



### Devastator II Mouse

|                     |    |
|---------------------|----|
| Performance.....    | 39 |
| Features .....      | 30 |
| Build quality ..... | 68 |
| Value .....         | 65 |

## Specifications

**Sensor type:** Optical; **Sensor:** PAN3509DH; **Switch type:** Omron D2FC-F-7N (10M); **LED lighting:** Single colour LED; **Interface:** USB 2.0; **Cable length:** 1.8 m; **Dimensions:** 7x11.8x3.6 cm

## Contact

**Cooler Master Co. Ltd.**  
**Phone:** 9901 322 254  
**Email:** sashank\_B@cooler-master.com.tw  
**Website:** www.cooler-master.com

# Coolpad Note 3S

Outdone

We quite liked the first Coolpad Note 3 that was launched back in 2015. Priced at ₹9,999, the new Coolpad Note 3S goes up against the Xiaomi Redmi 3S Prime and the Lenovo K6 Power, both of which offer a lot of value to users.

The Note 3S is curvier than its predecessors and feels quite good in your hand. The 13 MP rear camera has a slight bump, while the fingerprint sensor is slightly recessed into the clear plastic back. The phone feels pretty well built, but it doesn't look or feel as premium as its metal-bodied competitors.

The 5.5-inch 720p display is slightly warm with a slight colour shift



Price  
₹9,999

when viewed from angles. It should also be noted that the Coolpad Note 3S doesn't register more than five touches at a time.

Coolpad has also introduced a more stock like version of its CoolUI. However, Coolpad may require more time to polish the new UI.

As for performance, there are noticeable lags in Asphalt 8's menus, while load times for heavy games is also quite high. There are slight framing issues, but not enough to be a problem.

Images taken by it are pretty underwhelming. Photos are under saturated and subjects appear soft. Images taken at night feature lots of noise, with colour morphing.

There is very little to recommend the Coolpad Note 3S. Besides offering a decent build and display, the device is trumped in almost all aspects by all of its main competitors.

Shrey Pacheco



|                  |    |
|------------------|----|
| Features .....   | 74 |
| Performance..... | 52 |
| Design .....     | 68 |
| Value .....      | 60 |

## Specifications

**SoC:** Qualcomm Snapdragon 415; **RAM:** 3 GB; **Internal Storage:** 32 (+32 expandable) GB; **Display:** 5.5-inch 720p; **OS:** Android 6.0 Marshmallow; **Battery:** 2500 mAh

## Contact

**Coolpad**  
**Phone:** 1800-1027-159  
**Email:** Support site  
**Website:** www.coolpadindia.com/customer-care.html#

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**FOLLOW US ON...**

The Facebook logo, consisting of the word "facebook" in white lowercase letters with a registered trademark symbol, enclosed within a blue rounded rectangle with a glowing blue border.

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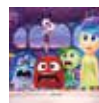
[digit.in/facebook](https://digit.in/facebook)





### \$2.5M worth books stolen

Thieves snuck into a warehouse and stole \$2.5 million worth of rare books by Newton, Da Vinci, Dante, and others. <http://digit.in/Bkthieve>



### Free storytelling lessons

Disney-owned animation studio, Pixar, is offering free online lessons in storytelling via Khan Academy. <http://digit.in/KhanPixar>

# SHOOTOUT: BEST SMARTPHONES BETWEEN ₹10-20K

## PICKING THE MID-RANGED WONDER



Prasid Banerjee

[prasid@digit.in](mailto:prasid@digit.in)

**F**irst things first, over the past year or so, more and more smartphone OEMs in India have been talking about the experience a smartphone provides. The reason is simple — the specs war had an expiry date and we're almost there. In our humble opinion, choosing a smartphone based on experience is always a better idea than going for raw specifications, even though specifications do matter to some extent on an Android phone.

With that said, this month's comparison considers 15 smartphones in the 10-20k price range. The sheer variation in specifications would tell you that we're trying to objectively judge the phones for the overall experience that they provide. We will be picking a best performer, best buy and the editor's pick.

We have even included phones like the Xiaomi Mi Max and Lenovo Phab 2 Plus, that would ideally appeal only to a niche audience. However, the comparison should give you a wholesome idea of what to buy irrespec-

tive of what your choices are. Remember, though, our picks are based on phones that provide the best experience and performance overall.

### PERFORMANCE

The term performance is generally associated with the processor and the raw power that a phone provides. As explained above, while our test sheets and formulae do combine other aspects into this section, for the sake of convenience, we're going to start discussing the speed of these devices, before we get to the camera and battery life.

With Qualcomm's Snapdragon 650 SoC, smartphones in the sub-15k and sub-20k price brackets had taken an incredible turn. But, that was all good till Lenovo went and screwed things up for everyone else. The company is currently selling a Snapdragon 820-powered phone for as low as ₹14,999. Use as many 14nm chipsets as you will, or Cortex A72 clusters, you're not beating a flagship-class so easily.

And that's exactly what has happened here. The Lenovo Z2 Plus edges past everything else in terms of



## Huawei Voice assistant

Huawei mobile chief Richard Yu says the company will have its own voice assistant soon in China. Learn more here: <http://dgit.in/HuaweiAI>



## Video calls for Signal

Currently available in the open beta with the new update, you can now make encrypted video calls using Signal. <http://dgit.in/encryptedV> **Smartphones**

# HOW WE TESTED

In testing smartphones, benchmarks are the first things to consider. They do not always represent real world performance, but they provide a good way to objectively compare the performance of smartphones. Our benchmarks of choice, that you'll see in upcoming pages, are AnTuTu, GFXBench Car Chase, 3D Mark Slingshot, 3D Mark Unlimited and Geekbench 4 Single and Multi Core. However, when reviewing phones, we do use other tools and benchmarks to better gauge performance. All of these readings and observations figure into the final score for the product.

Further, heat dissipation is often a major issue amongst cheaper smartphones. In our tests, we tested each smartphone for the amount of heat they generated. All the tests were performed in current room temperatures of about 27 degrees Celsius, and both gaming and video recording were measured. We used Asphalt 8 and Injustice: Gods Among Us, two resource intensive games to measure the temperature.

When measuring temperature, we played the same games for 15 minutes on each device, using a heat gun to measure

temperature on the device's body. Internal temperatures were also recorded. Similarly, video recording tests were conducted over 10 minutes.

It is worth mentioning that we split the whole test into three parts: Features, Performance and Design. The Performance section includes not only the raw power a phone has, but also its camera quality, battery life and call quality. The features part is self explanatory and the design section takes into consideration the display quality, materials used and even the user interface of the device.

To establish a common ground, all phones had exactly the same apps installed on them. This means whatever extra load is added on the device, would come from its own system and user interface or pre-installed apps.

Next, camera quality was measured in different light conditions. We keep a separate score for low light photography, since companies tend to market that aspect of devices often. However, all other conditions, including bright sunlight, indoors and others, are part of the normal light score that we arrive at. All phones were tested using the same images,

taken from each device. It is also worth noting that the front camera hasn't been considered, which is also why we left phones like the Vivo V5 and Oppo F1s out of this comparison. We are not prone to taking selfies ourselves, but if you do want one such comparison, do write to us, we are indeed equipped to present an objective comparison of front cameras.

Speed, battery life and camera quality aside, we did consider aspects like build quality, touch performance, the UI design, weights and ergonomics in general. Thinness of the phones was taken into account, as was the ease of use of its user interface.

Lastly, the pricing of each of the device has also been accounted for. While the best performer is chosen irrespective of price points, the best buy award is directly related to the price. We measure the overall performance per rupee, that you can get out of a device, with algorithms that are so complex that anyone more intelligent than a monkey can understand them.

So, without further ado, here's all you need to know about smartphones between ₹10,000 and ₹20,000.

raw power and speed. Its benchmark scores are nearly double, and sometimes triple, of what other smartphones can achieve. It is fast, responsive and snappy, like few smartphones can be. The Snapdragon 820 churns out oodles of raw power, leaving all of its competition behind.

However, while that does make the Lenovo Z2 Plus our best performer, we would note that in terms of real world performance, the Coolpad Cool 1 is just as great. The Lenovo Z2 Plus is faster, for the sake of comparison, but in real world terms, 4GB RAM and the Snapdragon 652 are also very hard to argue against.

What the Lenovo Z2 Plus and Coolpad Cool 1 promise is a lag free experience. While the former showed practi-

cally no noticeable lags, the latter was ever so slightly stuttery. What Lenovo has ideally done, is produce a smartphone that is just impossible to argue against, for just one spec. However, the Z2 Plus does belong to the Zuk series, and there's an enthusiast approach here.

In doing so, you can expect some UI issues. While the unit used for this comparison was sent to us by Lenovo, we considered another store-bought unit of the Lenovo Z2 Plus as well, and there are certain elements about that device that regular users may not enjoy. That, however, is a trade-off on phones that are meant for an enthusiast community, where the OS is supposed to be ever evolving and feature rich.

In terms of performance, the Xiaomi Redmi Note 4 seems to be the most dependable device, although we have seen MiUI updates cause issues on Xiaomi phones before. The Lenovo P2 also has a very good overall experience, thanks to the 14nm Snapdragon 625 SoC. The phone is of course battery centric, but few would be able to question its smoothness.

## Camera

It's a wonderful world we live in nowadays. You can buy a dual-camera smartphone at well below ₹20,000. If that isn't improvement then we do not know what is. Amongst the many "improvements" that smartphone makers have tried to bring about in cameras, dual-cameras are perhaps the first to show real impact.

You would expect the Honor 6x or the Coolpad Cool 1 to win the prize here, right? Well, think again. Our tests suggest the little known ZTE Nubia Z11 Mini is the best phone for those who want a camera over everything else. ZTE corrected the shutter lag issue from the Z9 Mini, producing a phone that can take very good images in all light conditions, considering its price.

The Nubia Z11 Mini doesn't mess up the contrast ratio and produces well balanced colours, something that many smartphones today are unable to do. In low light, the Nubia Z11 Mini's camera software tries to brighten photos artificially, making colours a tad bleak in the process. However, the overall results are still far better than its

| Brand                               | Xiaomi              | Lenovo              | Honor               | Asus                | ZTE                 | Xiaomi              |  |
|-------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|--|
| Phone                               | Xiaomi Redmi Note 4 | Lenovo K6 Note      | Honor 6X            | Asus Zenfone 3s Max | ZTE Blade A2 Plus   | Xiaomi Mi Max       |  |
| System-On-Chip                      | Snapdragon 625      | Snapdragon 430      | Kirin 655           | MediaTek MT6750     | MediaTek MT6750T    | Snapdragon 650      |  |
| RAM                                 | 4GB                 | 3GB                 | 3GB                 | 3GB                 | 4GB                 | 3GB                 |  |
| Display                             | 5.5inch FHD         | 5.5 inch FHD        | 5.5 inch FHD        | 5.5 inch HD         | 5.5 inch FHD        | 6.4 inch FHD        |  |
| Operating System                    | Android Nougat      | Android Marshmallow | Android Marshmallow | Android Nougat      | Android Marshmallow | Android Marshmallow |  |
| Battery Size                        | 4100 mAh            | 4000 mAh            | 3340 mAh            | 5000 mAh            | 5000 mAh            | 4850 mAh            |  |
| Rear Camera                         | 13MP                | 16MP                | 12+2MP              | 13MP                | 13MP                | 16MP                |  |
| Front Camera                        | 8MP                 | 8MP                 | 8MP                 | 8MP                 | 8MP                 | 5MP                 |  |
| Price                               | 12999               | 13999               | 13499               | 14999               | 11999               | 14999               |  |
| Overall Scores                      | 73.00283672         | 66.46258307         | 71.54810912         | 64.71839632         | 65.6428966          | 74.64966614         |  |
| <b>Performance</b>                  |                     |                     |                     |                     |                     |                     |  |
| GFX Bench (Car Chase)               | 298.3               | 144.2               | 174.8               | 137.3               | 137.3               | 330.2               |  |
| AnTuTu 6.0                          | 68621               | 44394               | 56779               | 39148               | 43091               | 78260               |  |
| 3D Mark Sling Shot                  | 851                 | 572                 | 569                 | 567                 | 567                 | 1316                |  |
| 3D Mark Unlimited                   | 14202               | 9513                | 11840               | 8488                | 9597                | 17994               |  |
| Geekbench Single Core               | 824                 | 629                 | 790                 | 593                 | 603                 | 1110                |  |
| Geekbench Multi core                | 2898                | 2062                | 3323                | 2445                | 2556                | 2668                |  |
| Temperature on Gaming               | 37                  | 38                  | 37                  | 38.5                | 39                  | 37                  |  |
| Temperature on Video Recording      | 38                  | 38                  | 38                  | 35                  | 35                  | 36                  |  |
| Camera (Normal light)               | 3                   | 3.5                 | 4.5                 | 3                   | 3                   | 3.5                 |  |
| Camera (low light)                  | 3                   | 3                   | 3.5                 | 2                   | 2                   | 3                   |  |
| Camera (shutter response)           | 4                   | 3                   | 3.5                 | 3                   | 1.5                 | 4.5                 |  |
| Camera (Video recording)            | 3.5                 | 3.5                 | 3                   | 3                   | 3                   | 4                   |  |
| Battery life (in minutes)           | 535                 | 481                 | 349                 | 762                 | 713                 | 409                 |  |
| <b>Features</b>                     |                     |                     |                     |                     |                     |                     |  |
| Processor max clock speed           | 4                   | 5                   | 5                   | 3                   | 3                   | 4                   |  |
| Processor cores                     | 8                   | 8                   | 8                   | 8                   | 8                   | 6                   |  |
| RAM                                 | 4                   | 3                   | 3                   | 3                   | 4                   | 3                   |  |
| Display PPI                         | 401                 | 401                 | 403                 | 282                 | 401                 | 342                 |  |
| Display type                        | 3                   | 3                   | 3                   | 3                   | 3                   | 3                   |  |
| Internal Storage space              | 64                  | 32                  | 32                  | 32                  | 32                  | 32                  |  |
| Front Camera (Resolution)           | 5                   | 13                  | 8                   | 8                   | 8                   | 2                   |  |
| Rear Camera resolution (in MP)      | 13                  | 13                  | 12+2                | 13                  | 13                  | 16                  |  |
| Dual Camera                         | 0                   | 0                   | 1                   | 0                   | 0                   | 0                   |  |
| Expandable Memory (Y/N)             | 1                   | 1                   | 0                   | 1                   | 1                   | 1                   |  |
| 4G (Y/N)                            | 1                   | 1                   | 1                   | 1                   | 1                   | 1                   |  |
| OS                                  | 5                   | 4                   | 4                   | 5                   | 4                   | 4                   |  |
| Battery rating (mAh)                | 4100                | 4000                | 3340                | 5000                | 4900                | 4850                |  |
| Thinness (mm)                       | 8.4                 | 8.9                 | 8.2                 | 8.9                 | 9.8                 | 7.5                 |  |
| Weight (in gms)                     | 175                 | 190                 | 162                 | 175                 | 189                 | 203                 |  |
| Fingerprint Sensor                  | 1                   | 1                   | 1                   | 1                   | 1                   | 1                   |  |
| <b>Design</b>                       |                     |                     |                     |                     |                     |                     |  |
| Looks                               | 3.5                 | 3.5                 | 4                   | 3                   | 3                   | 4                   |  |
| Build Quality: Materials Used       | 4                   | 4                   | 5                   | 4                   | 4                   | 4                   |  |
| Build Quality: Glass Protection     | 5                   | 5                   | 5                   | 4                   | 4                   | 5                   |  |
| Build Quality: Button Quality       | 3.5                 | 3.5                 | 4                   | 3.5                 | 3.5                 | 5                   |  |
| Screen Quality: Luminance (in Lux)  | 474                 | 573                 | 660                 | 575                 | 575                 | 510                 |  |
| Screen Quality: Sunlight Visibility | 3.5                 | 3                   | 2.5                 | 3.5                 | 3.5                 | 4                   |  |
| Screen Quality: Colour Accuracy     | 4                   | 3.5                 | 4                   | 3.5                 | 3.5                 | 3.5                 |  |
| Screen Quality: Viewing Angles      | 4                   | 3.5                 | 5                   | 4                   | 4                   | 4                   |  |
| Touch performance                   | 5                   | 3.5                 | 4                   | 4                   | 4                   | 5                   |  |
| Interface design                    | 4                   | 3.5                 | 4                   | 3                   | 3                   | 4                   |  |
| Ergonomics                          | 3.5                 | 3.5                 | 4                   | 3.5                 | 3                   | 3                   |  |



|  | Lenovo              | Lenovo              | Coolpad             | Motorola            | Asus                 | LeEco               | ZTE                 | Lenovo              | ZTE                 |
|--|---------------------|---------------------|---------------------|---------------------|----------------------|---------------------|---------------------|---------------------|---------------------|
|  | Lenovo P2           | Lenovo Z2 Plus      | Coolpad Cool 1      | Moto G4 Plus        | Asus Zenfone 3 Laser | LeEco Le 2          | ZTE Nubia N1        | Lenovo Phab 2 Plus  | ZTE Nubia Z11 Mini  |
|  | Snapdragon 625      | Snapdragon 820      | Snapdragon 652      | Snapdragon 617      | Snapdragon 430       | Snapdragon 652      | MediaTek Helio P10  | MediaTek MT8783     | Snapdragon 617      |
|  | 4GB                 | 4GB                 | 4GB                 | 4GB                 | 3GB                  | 3GB                 | 3GB                 | 3GB                 | 3GB                 |
|  | 5.5 inch FHD        | 5 inch FHD          | 5.5 inch FHD        | 5.5 inch FHD        | 5.5 inch FHD         | 5.5 inch FHD        | 5.5 inch FHD        | 6.4 inch FHD        | 5 inch              |
|  | Android Marshmallow | Android Marshmallow | Android Marshmallow | Android Marshmallow | Android Marshmallow  | Android Marshmallow | Android Marshmallow | Android Marshmallow | Android Marshmallow |
|  | 5100 mAh            | 3500 mAh            | 4060 mAh            | 3000 mAh            | 3000 mAh             | 3000 mAh            | 5000 mAh            | 4050 mAh            | 2800 mAh            |
|  | 13MP                | 13MP                | 13MP+13MP           | 16MP                | 13MP                 | 16MP                | 13MP                | 13MP                | 16MP                |
|  | 5MP                 | 8MP                 | 8MP                 | 5MP                 | 8MP                  | 8MP                 | 13MP                | 8MP                 | 8MP                 |
|  | 17999               | 14999               | 13999               | 13499               | 16999                | 11999               | 11999               | 14999               | 12999               |
|  | 73.70360087         | 87.01581573         | 77.66384107         | 68.22356765         | 64.41178063          | 72.58890382         | 62.73998423         | 62.87226537         | 66.09899312         |
|  | 218.6               | 906.9               | 330.5               | NOT SUPPORTED       | 140.5                | 255                 | 113.8               | NOT SUPPORTED       | 199                 |
|  | 63637               | 128644              | 82921               | 46148               | 43949                | 80811               | 46864               | 27222               | 35954               |
|  | 846                 | 2962                | 973                 | 670                 | 294                  | 867                 | 489                 | 198                 | 308                 |
|  | 13741               | 27831               | 13391               | 9837                | 9569                 | 13157               | 8941                | 17994               | 7524                |
|  | 791                 | 1705                | 1489                | 723                 | 627                  | 1530                | 733                 | 613                 | 697                 |
|  | 2898                | 3521                | 2205                | 3056                | 1944                 | 5001                | 2696                | 2482                | 1901                |
|  | 37                  | 38.2                | 37                  | 37                  | 38                   | 41                  | 39                  | 35                  | 37                  |
|  | 34                  | 40.9                | 39                  | 37                  | 39.5                 | 40.6                | 39.5                | 38                  | 38                  |
|  | 3                   | 3                   | 4                   | 4                   | 4                    | 3                   | 3                   | 3                   | 5                   |
|  | 2.5                 | 2.5                 | 3.5                 | 4                   | 4                    | 2.5                 | 3                   | 2                   | 4.5                 |
|  | 3.5                 | 4                   | 3.5                 | 4                   | 3.5                  | 3.5                 | 3.5                 | 3.5                 | 4                   |
|  | 3.5                 | 3.5                 | 3.5                 | 4                   | 4                    | 3                   | 3                   | 3.5                 | 4                   |
|  | 1254                | 469                 | 384                 | 326                 | 595                  | 471                 | 529                 | 465                 | 449                 |
|  | 4                   | 5                   | 4                   | 3                   | 3                    | 4                   | 5                   | 3                   | 3                   |
|  | 8                   | 4                   | 8                   | 8                   | 8                    | 8                   | 8                   | 8                   | 8                   |
|  | 4                   | 4                   | 4                   | 3                   | 4                    | 3                   | 3                   | 3                   | 3                   |
|  | 401                 | 424                 | 401                 | 401                 | 401                  | 401                 | 401                 | 344                 | 441                 |
|  | 5                   | 3                   | 3                   | 3                   | 3                    | 3                   | 3                   | 3                   | 3                   |
|  | 64                  | 64                  | 32                  | 32                  | 32                   | 32                  | 32                  | 32                  | 32                  |
|  | 8                   | 2                   | 8                   | 2                   | 8                    | 8                   | 13                  | 8                   | 8                   |
|  | 13                  | 13                  | 13+13               | 16                  | 13                   | 16                  | 13                  | 13                  | 16                  |
|  | 0                   | 0                   | 1                   | 0                   | 0                    | 0                   | 0                   | 0                   | 0                   |
|  | 1                   | 0                   | 0                   | 1                   | 1                    | 0                   | 1                   | 1                   | 1                   |
|  | 1                   | 1                   | 1                   | 1                   | 1                    | 1                   | 1                   | 1                   | 1                   |
|  | 4                   | 4                   | 4                   | 4                   | 4                    | 4                   | 3                   | 4                   | 3                   |
|  | 5100                | 3500                | 4060                | 3000                | 3000                 | 3000                | 5000                | 4050                | 2800                |
|  | 8.3                 | 7.5                 | 8.2                 | 7.9                 | 7.9                  | 7.7                 | 8.9                 | 9.6                 | 8                   |
|  | 185                 | 145                 | 167                 | 155                 | 150                  | 153                 | 190                 | 218                 | 138                 |
|  | 1                   | 1                   | 1                   | 1                   | 1                    | 1                   | 1                   | 1                   | 1                   |
|  | 3.5                 | 4                   | 4                   | 3.5                 | 4                    | 4                   | 3.5                 | 4                   | 4.5                 |
|  | 5                   | 4                   | 5                   | 3.5                 | 4                    | 5                   | 3.5                 | 5                   | 4                   |
|  | 4                   | 5                   | 5                   | 5                   | 3.5                  | 5                   | 3                   | 4                   | 5                   |
|  | 3.5                 | 4.5                 | 4                   | 4                   | 4                    | 4                   | 4                   | 4                   | 4                   |
|  | 692                 | 547                 | 523                 | 586                 | 598                  | 480                 | 520                 | 469                 | 415                 |
|  | 3                   | 4                   | 3.5                 | 4                   | 3.5                  | 3                   | 2.5                 | 3.5                 | 3.5                 |
|  | 3.5                 | 4                   | 4.5                 | 3.5                 | 3.5                  | 3.5                 | 3                   | 3.5                 | 4.5                 |
|  | 4                   | 5                   | 5                   | 4.5                 | 3                    | 4                   | 4                   | 3.5                 | 5                   |
|  | 4                   | 5                   | 4.5                 | 5                   | 3.5                  | 4.5                 | 3.5                 | 3.5                 | 4                   |
|  | 3.5                 | 2.5                 | 4                   | 4.5                 | 3                    | 4                   | 3                   | 4                   | 3.5                 |
|  | 4                   | 5                   | 4                   | 4                   | 4.5                  | 3.5                 | 3                   | 3                   | 5                   |



## Xiaomi's personal SoC?

Xiaomi might join Samsung, Apple and Huawei in the elite club of smartphone makers building their own processors. <http://dgit.in/xiaomiSoC>

## Projector toy for kids

FollowGrams is a smart projector toy for kids lets them trace any smartphone photo and project it on paper. <http://dgit.in/projectKid>

competitors. Of course, the Z11 Mini has its weaknesses in UI, speed and battery life, but if camera is your main requirement, we think you should consider this one.

The Honor 6X and Coolpad Cool 1 are our second and third choices in the camera department. Between these two, the Cool 1 loses white balance a bit too often, which lands it in the second place. The Honor 6X produces nicely saturated photos with its dual-camera, although both are unable to produce the details that the Nubia Z11 Mini can produce. Where the Honor and Coolpad devices excel though, is in producing bokeh effects, by phone standards anyway. Don't go expecting DSLR quality bokeh from these.

### Battery

With performance and camera dealt with, our comparison also takes into account the battery life of these devices. For this, we used the PC Mark Work 2.0 battery benchmark to get side-by-side results of each device. The PC Mark test emulates real world usage, by playing videos, browsing and editing documents on the device. It noted the time taken for the battery to drop from 80% to 20%, which is the sweet spot for battery performance. We have obviously tested the real world battery performance of all these devices when reviewing them, so we have a direct parallel for each PC Mark score that we got.

The battery test is another arena where Lenovo steals the show. The Chinese manufacturer's Lenovo P2 came out far ahead of anyone else in this department, lasting almost 21 hours on the PC Mark test. Second, and closest to this device was the

Asus Zenfone 3s Max, which came in at just over 12 hours, while the ZTE Blade A2 Plus followed, lasting 11.8 hours on the PC Mark test.

In terms of real world, you can expect a full day's (not a work day) worth of battery life out of the Zenfone 3s Max and the ZTE Blade A2 Plus, but the Lenovo P2 is perhaps the only smartphone that can carry on



Lenovo Z2 Plus

for more than that. We have been able to make it last for two days, without much effort.

The Lenovo P2 is also better than the other two in other aspects, like speed and camera performance. The Asus and ZTE smartphones make major compromises to churn out battery life, but can't match up. For a battery centric buyer, the Lenovo P2 makes a lot of sense, but you're nearing the 20k mark, since the P2 costs ₹17,999 for the 4GB variant.

Here, we must mention that while these three smart-

phones were battery centric, the 10-20k segment provides decent battery life in general. Phones like the Xiaomi Redmi Note 4, Coolpad Cool 1, Honor 6X, and Xiaomi Mi Max all last for almost a day. With the exception of the Lenovo Phab 2 Plus and Lenovo Z2 Plus, not many produce battery life that we haven't already seen in this segment.

### FEATURES

In terms of features, most of these phones are similarly matched. They all have fingerprint sensors and are driven by similarly matched SoCs. However, Huawei's Kirin 655 SoC is noticeably slower than the Snapdragon 650 and 652 powering its primary competitors. As mentioned earlier, the Snapdragon 820 is much faster than all the other SoCs here.

ZTE's choice of the MediaTek Helio P10 for the Nubia N1 is unfortunate, but the company has actually done quite well in optimising performance. The Helio P10 performs much better here than what we've seen on many other smartphones, barring perhaps the Oppo F1 Plus, which is also much more expensive.

The Cortex A72 cores in the Snapdragon 650 and 652 give them a huge boost in terms of raw power, while the Kryo CPU on the 820 is Qualcomm's own formula for success. As we mentioned earlier, Lenovo hasn't taken complete advantage of this, but has been able to churn out more performance than competing devices in this comparison.

We noticed that the two phones running on MediaTek's MT6750 SoCs were the weakest of the lot, showing the most lags and stutters, while the MediaTek MT8783 on the

Lenovo Phab 2 Plus is equally slow. Overall, these three made for the bottom rung in terms of pure performance. The Snapdragon 617 on the Moto G4 Plus is older, but incredibly stable, and Moto has the right background enhancements to make its performance smoother than expected.

In terms of camera resolution, you'll mostly see 13MP sensors on these smartphones. The Xiaomi Mi Max, Moto G4 Plus and the LeEco Le 2 use 16MP sensors, but they aren't evenly matched. The G4 Plus delivers much better image quality than the other two, producing better colours and sharpness. Low light performance is also significantly better on the Moto G4 Plus.

The Coolpad Cool 1 and Honor 6X stand out with their dual-camera sensors. While Coolpad uses two 13MP sensors on the back, the Honor phone uses a 12MP and 2MP camera on the back. Here, though, Coolpad uses its two sensors in RGB and Black and White mode, which should ideally produce more details. However, after thorough testing, we found the Honor 6X to be slightly ahead, even though its 2MP sensor is used only for depth perception and contrast.

Most of these phones are pretty light as well, with the exception of the huge Xiaomi Mi Max and Lenovo Phab 2 Plus, which do not aim to impress in terms of ergonomics.

### DISPLAY

The first thing you see on any smartphone is its display. It may have a fast chipset, oodles of RAM and the best camera ever, but it's the display that sets the first impression, and

## WeChat coffee gifting

China's top messaging app, WeChat is partnering with Starbucks. Users in China can now gift friends a coffee via chat <http://dgit.in/Chatcoffee>



## Battery/Memory/Stylus

ChargeWrite is a \$29 device that has a pen, a stylus, and 1,000 mAh battery pack with a Lightning and Micro USB jack. <http://dgit.in/chargeWrite>

Smartphones

just like in life, first impressions are important.

To test displays, we use a combination of colour charts, high resolution images, black and white saturation tests and an HTC Instruments luminance meter to check the brightness of the display. The last test is done in a completely dark room, to cut off as much ambient light as possible. We turn off the display's auto-brightness feature, so as to provide an even playing field for all phones.

For the uninitiated, brightness is a subjective term, which can differ from person to person. What you find "bright" may not be up to our standards. It depends on things like ambient light and very importantly, the person's eyes. Luminance on the other hand, reflects the amount of light that is emitted by the display, giving an objective view of what can be considered bright.

After testing, the Lenovo P2 and Honor 6X came out on top, in terms of luminance, with ratings of 692 Lux and 660 Lux, respectively. However, the P2's Super AMOLED produces punchier colours, making the display vibrant and more colourful. The LTPS panel on the Honor 6X still needs backlights to light it up, which affects colour reproduction. However, the AMOLED panel on the P2 can turn individual pixels on and off, controlling colour reproduction minutely. Of course, the easiest way to spot this difference is through testing blacks.

The combination of brightness and good colours makes the P2 the most attractive display out here, and Lenovo has added a premium feel by making it resistant to fingerprints as well.

## DESIGN

Now that we're through with the main elements of testing, we're left with design. In our opinion, design is never the first priority in the under 20k segment, although that doesn't mean one can get away with anything. In this test, 50% weightage has been given to performance, while 30% and 20% are reserved for features and design, respectively.

It is easy to spot the similarities between the ZTE Blade A2 Plus, Xiaomi Redmi Note 4, Lenovo K6 Note, ZTE Nubia N1 and Asus Zenfone 3 Laser. In fact, the Honor 6X and Coolpad Cool 1 follow the same design language, but their dual-cameras give them a distinct look.

The designs we really admire here are those on the Lenovo P2, Lenovo Z2 Plus and the ZTE Nubia Z11 Mini. Both the Lenovo devices are made for single handed usage. They're both compact, which is even

more commendable for the larger Lenovo P2. Of course, the Lenovo Z2 Plus' smaller display makes it even more compact, however. It's glass-like back also feels different, if not absolutely premium.

The Nubia Z11 Mini is another phone that has a glass design, and the combination of a glass back, metal frame and compact dimensions makes it quite good as well. Overall, in terms of pure ergonomics, it's the Lenovo Z2 Plus that is most easy on your hands.

The Xiaomi Mi Max and Lenovo Phab 2 Plus are obviously not meant for ergonomics, but here we'd pick the Mi Max. This is because the Mi Max is thinner and hence easier to slip into your pocket. Yes, that isn't a prerequisite for large phablets, but we did say you can't get away with anything, right? The Lenovo Phab 2 Plus is too thick and heavy to use comfortably.

## BEST PERFORMER: Lenovo Z2 Plus

It is no surprise that the Lenovo Z2 Plus comes out as the best performer. On some level, specifications do matter, and the Snapdragon 820 on the Lenovo Z2 Plus is simply too powerful for any other SoC in this comparison. We do implore you to read the performance section completely in order to make the right choice for yourself, though.

## BEST BUY: LeEco Le 2


It's pretty much second in terms of performance, but the LeEco Le 2 edges out the Coolpad Cool 1 to become the best buy, purely on its pricing. The device currently costs ₹11,999, which makes it more value for money. However, if



Xiaomi Redmi Note 4

you do want a better camera, spending an extra ₹2000 on the Coolpad Cool 1 would be a good idea. The Le 2 excels in performance, design and many other aspects, but its camera is the weak link here. Interestingly, the camera is also the only real difference between the Le 2 and Cool 1.

## EDITOR'S PICK: Xiaomi Redmi Note 4

The Snapdragon 625 on the Redmi Note 4 is meant for efficiency, and efficient is just what this smartphone is. It is neither the fastest, nor does it have the best battery life, and it's camera isn't the best in the business either. If you have a Redmi Note 3, this isn't worth "upgrading" to. However, if you want a new phone and want something that is dependable, the Xiaomi Redmi Note 4 is the perfect jack of all trades. 



LeEco Le 2



## QnA

70

We solve troubleshooting queries in routers, smartphone USB connectivity, delayed notifications and more...

## Tips &amp; tricks

72

Get the best out of the latest macOS, Sierra. Once you're done with that, checkout Dropbox's cloud-based collaborative tool, Paper.

# TRACK EVERYTHING

## WHO SAID LIFE COULDN'T BE ALL CHARTS AND NUMBERS?

Arnab Mukherjee

arnab@digit.in

**W**e live in the age of data, and if you're the kind that loves numbers, charts and graphs, there hasn't been a better time in history for you to be alive. Almost every action that you take is tracked in some way or the other on some device or platform. But what good is all that data if you cannot make any sense of it? That's where this workshop comes in - we show you how you can track everything - and we mean EVERYTHING!

### TRACK FINANCES

Almost all of us are guilty of being bad with money at some point in our lives. No? Well even if you haven't, you'll probably find certain tools very helpful to supercharge your already



Track your money lest it sneak away under your nose!

sharp money management skills. Interestingly, the increasing volume of digital transactions also makes



your job easier when it comes to keeping track of your finances. Today, every transaction, card swipe, and online payment generates an SMS which gets sent to your phone and that's exactly what apps like Walnut track to provide you with a neat overview of your finances.



## Magnets for depression

Brain science startup, NeuroQore wants to shoot magnetic pulses into your brain to try to treat mental disorders <http://dgit.in/NeuroQore>



## Life on planet Ceres

Researchers have detected organic compounds on the dwarf planet Ceres, that lies between Mars and Jupiter. <http://dgit.in/CeresLife>

Workshop



You can even rate your sleep!

Once you've downloaded the app and allowed it the necessary permissions it needs, you'll find that the app quickly generates a lot of reports and charts (from your SMS inbox) showing you your expenses across time, categories, vendors and even daily reports on how much you're spending. Want to check how much you generally spend on food vs healthcare? You can, right down to a pie chart. Walnut pretty much takes care of all your financial tracking needs with one app.

## TRACKHEALTH

Fitness trackers are quite ubiquitous these days and almost every single one has a pretty standard set of features in step tracking, basic sleep tracking and certain smartphone alerts. But technology is capable of much more right now. In fact, your humble smartphone can do a lot of the things that you would buy a fitness tracker for in the first place. On the other hand, there are quite a few dedicated devices that offer you a more in depth analysis than a standard fitness tracker.

### Track Sleep

When it comes to sleep, get the Sleep as Android app from the Play Store or MotionX 24/7 from the App Store. Both apps offer in-depth sleep

tracking with graphs showing you your sleep quality over the night. They also go beyond that by tracking your snoring and sleep-talking. All the data is presented in the form of easy to understand reports that will satisfy your tracking needs.

### Track Workout

For your activities, the Fitbit Surge and the Garmin Forerunner come well recommended, but in reality, the onus lies on the app they are syncing to. Google Fit is definitely one of the most reliable and brand agnostic apps that offers you some very interesting insights and graphs pertaining to your everyday workout. Get the app and use it as it is, or connect it to other apps on your phone that sync with



your wearables. In either case, head over to Timeline to see your workout details – walks, runs and cycle rides – in graphs with respect to time. On the



Fitness trackers are no good if you don't workout after getting one.

other hand, for more in depth workout analysis, Strenx by Gymwatch is very interesting, but unfortunately it doesn't ship to India yet.

### Track Stress

Pip is a device that is designed to help you deal with stress. And yes, it does ship to India. So when you get the device, connect it with the PIP Stress Tracker app and use it for destressing sessions. The app shows you your stress levels in the overview section, broken down into percentage of time you were steady, relaxed and stressed respectively.

## TRACKGAMESTATS

As of now, there is no all encompassing game tracking tool that can tell you detailed statistics about each and every possible game that you play. What comes close is Overwolf.



Use PIP to track your stress, and hopefully get rid of it too.



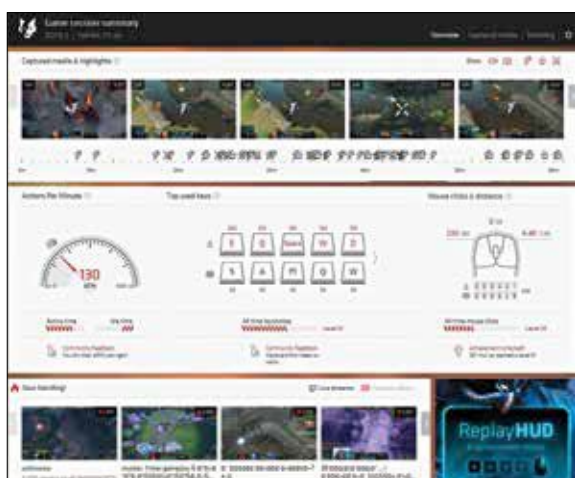
## New Twitch Communities

Twitch, the video game streaming site launches Communities to help gamers organize around their shared interests. <http://dgit.in/TwitchNew>



## New walkie-talkie Mod

The latest Moto Mod has a "smart" walkie-talkie attachment and comes with a 1,500mAh battery with 20 hours standby. <http://dgit.in/MotoTalk>



Overwolf is a neat game statistic tracker.

A platform that allows developers to create extensions and overlays for games, Overwolf itself has some pretty neat statistics tracking and display. Get the tool from the Overwolf website and once it is up and running, fire up any game and complete a gaming session. Once your session is done, you will be shown a Game Summary, that will include basic information like your play time today (and the week) compared to the community average. Some supported games also show additional stats. For example,



CS:GO shows you your actions per minute, most used keys, mouse clicks etc. Get it to analyse your playing style, as it also shows you GIFs of your deaths, kills and other important actions in-game. Overwolf also has an app store of its own with game-specific apps. These include apps which let you track your statistics while in-game as well.

## TRACK SOCIAL MEDIA (INSIGHT TOOLS)

There are multiple inbuilt tools to analyse your own social media accounts and they are quite easy to find. For example, Facebook pages have insights as an additional tab. Instagram now offers insights via a tab you can click below every post and your overall profile at the top right. There there's Twitter

analytics, Pinterest analytics and more. What we are looking at are third party tools that take these insights one step further.

### Track Twitter

Check out Followerwonk's free analysis tool that lets you check out stats related to any Twitter profile, including your own. And we don't mean basic stats like follower and tweet count. Just enter the username and chose a category between 'Followers' and 'Following' and hit go – you will have a deluge of charts and graphs at your disposal regarding Active Time, Social authority, URL tweets and more.

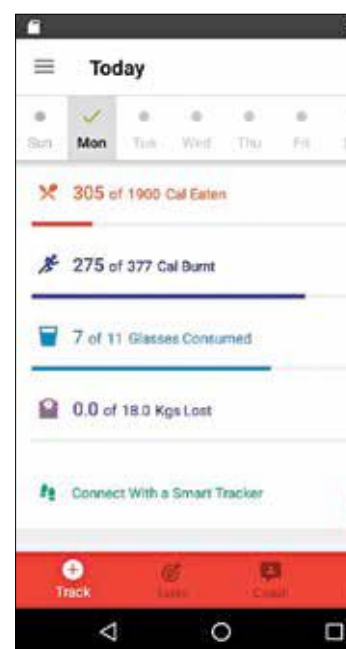
### Track Facebook

Head over to the trusted Wolfram Alpha search engine and connect it to your Facebook account. After that, simply search for 'Facebook report' to see expected list-like info about your profile - Recent posting history – posted links, vs. statuses vs. photos, the most frequent times and days of the week that you post, total likes and comments, average likes and comments, and average length of your most recent posts, what words you use most frequently – and a word cloud! And many more interesting visuals as well.

## TRACKFOOD

While there are quite a few detailed food trackers for western dishes, the

sheer diversity of the Indian palate makes it tough to track calories and nutrient information in your daily diet. Apps like HealthifyMe are trying to change that. While it does provide additional features like 21-day fitness plans and workout tracking via Google Fit connection, we are interested in the food tracking feature. To use it, go to the Diary section, tap on the day on the calendar, Hit 'Track Food' on the next section and keep logging your meals. While logging through images is a premium feature, you can dictate your meal as well. The app will provide you with a detailed breakup of nutrients in your diet as well as the top calorie con-



Diet is important. Keep track!

tributors. Based on this, it also provides you with alternatives to reduce the calorie count in your meal.

## TRACK WEBSITE USAGE

If you own a website and want to see a heatmap-like representation of popular content on your page, there are free tools available that let you do that. One of the popular ones is heatmap.me which lets you create an account for free. All you need to do is to add a block of code to the <head> tag section (for non-Wordpress sites) or get a plugin (for Wordpress sites)





## Bond' smart IR blaster

Bond is a smart home accessory that can add some IoT utilities to older devices that don't have internet access. <http://dgit.in/BondIR>



## Open-source simulator

Udacity is open-sourcing their self-driving car software allowing anyone with a working knowledge to operate on it. <http://dgit.in/udacitycar>

Workshop

and you can check a heatmap overlay on your site by hitting Alt+Shift+H or using the Wordpress plugin. Some of the other tools that let you do this for free are PTengine and CrazyEgg. The PTengine dashboard also shows you a lot of other useful information pertaining to your website.

## TRACKWEB BROWSING

While your own browsing history being revealed to the world is the stuff horror stories are made of, for some of us, getting insights based on your browsing habits is not a bad idea. Using the Chrome extension Web Historian (not available yet for other browsers,



but you can always import your history into Chrome) you can get amazing visualisations of your web browsing history - browsing preferences, search clouds, a web-like visualisation of your browsing network and a time heatmap of when you are most active.

## TRACKPC USAGE

A lot of us work on computers - and that means we always have a number of distractions available just a click



Track your driving like never before.



away. So it is really important to track your PC usage to figure out where you're spending (or wasting) time. RescueTime is an all-in-one solution to track most of your PC usage. First, you need to sign up and choose either the free RescueTime Lite plan or go ahead and get the Premium one. A simple installation and a Chrome extension later, you'll find the RescueTime software running in the background on your computer, consuming next to no resources. After some significant usage (preferably a typical work day) head to your RescueTime Dashboard to check which applications you use the most, which websites you visit the most and more information - based on productivity, categories and more. You can even break down the overview charts to application specific reports. To do that, go to the Reports dropdown menu on the top and select 'Applications and Websites'. Most importantly, you can compare your productive time vs your distracted time head to head. The Premium version has even richer reports.

For a detailed breakdown on your peripheral usage, get WhatPulse. It is downloadable at <https://whatpulse.org/downloads/> for Windows, Mac and Linux. While the application usage data in the Uptime section is not as well presented as in RescueTime, WhatPulse's strength lies in the Input section. Go to the tab and check out a heatmap of your keyboard, or a list of the keys used against the number of times they've been used, or the applications that you've most interacted with and

more. You can also check out heatmaps for your mouse usage and other similar data.

## TRACKSMARTPHONE USAGE

Stats pertaining to touchscreen, app usage, swiftkey type of keystroke analysis, and more. There have been quite a few apps that can throw data at you about your smartphone usage. A few of the interesting ones are CPU-X, that shows a CPU usage graph across frequencies, and Sensors Multitool, which shows you a live usage graph of all sensors on your phone. But what can you do with this data?

If you want data similar to what RescueTime offers for the desktop, you can actually get the RescueTime app for Android and check your app usage across categories and use types. In fact, link your smartphone app to the same account that you are using on your desktop and your overall stats will be linked too. To do that, simply sign in with the same account on your smartphone.

## TRACK DRIVING

You can track your own, or someone else's, driving quite easily by using an On-board diagnostics (OBD) device paired with your smartphone. Drivemate is good option in India (<http://www.mapmyindia.com/drivemate/product>). You can even get an OBD connector to use a smartphone app as your OBD device.

On the other hand, if you want the same key usage data that you got from WhatPulse, you need to use one of the most popular smartphone keyboards out there - SwiftKey. After you've used the app for a while, open the app to get a lot of insights about your smartphone typing habits - like the main topics you type about, Swiftkey usage stats, smiley usage, your signature smiley and your smartphone keyboard heatmap. Sadly, you cannot use filters to limit the stats to a specific time, but this is more than what is generally available, so we are not complaining! 🇮🇳



### Beam for Xbox One

Microsoft's Beam game streaming app will be available for Xbox One Insider Program members. Learn more: <http://dgit.in/BeamMS>



### Apple is moving WWDC

Apple announces that the conference happening on June is moving back to San Jose. <http://dgit.in/WWDCshift>

# Repurposing old routers, automatic iOS reboots and app crashes in Android

This month we came across the menacing issue of automatic reboots and app crashes in mobile devices, along with laggy systems

## Router as a repeater

Sir, I have a small problem which only you can solve. Currently, I have two routers in my house both of which I have listed below.

1. D-Link 2750U ADSL
2. Digisol DG-BG4011N ADSL

The Digisol router is very old. I had bought it five years ago and now it's almost scrap.

Now I got a D-Link Router which is better than the earlier one. (Both of them are ADSL Modem Routers). On the web, I saw that I can use my old Digisol router as a wireless repeater or wireless range extender. I was planning to buy a new one but then I thought of this cheap idea. I had even lost the adapter of the old router but just for this purpose, I bought a new one for 200. I tried all methods on the web but none of them worked, maybe because this is a very old model. I know that making a wireless access point is very easy and that was suggested on the web in most of the sites. Just connect the two routers through a LAN cable and then do some changes in the settings of the two routers, that's it. The problem is that I can't waste my money for buying 20 or 30 metres of LAN cable and fit them on the wall since it's also very difficult. So, please don't suggest me this idea. I want to convert my old Digisol router into a "wireless range extender", which means that I don't want to use any extra cables. You're now my last hope. If you don't help me, then that lovely old router would go to the bin. I would be eagerly waiting for your answer and sorry for the long letter.

—Prashanth J.K.

**A** Hey Prashanth, we checked out the manual of the Digisol router that you've mentioned above. It doesn't support a repeater functionality so you won't be able to use it as an extender or repeater even in the wireless setting. The chipset inside doesn't support the necessary firmware required to act as a repeater. Since it's a low cost router, there aren't any custom firmware available on the OpenWrt forums.



D-Link 2750U ADSL

## No USB connection

Dear Sir, I'm experiencing trouble in connecting my HTC Desire 826 to my PC. I'm running Windows 7 Home basic. I've tried many times but every time the HTC device manager comes up and nothing shows. I can't see the memory card or any files. Please help me out with solutions.

**A** Generally, this problem arises when the device drivers aren't installed properly. To verify, you need to connect your phone and head over to Device Manager from the Control Panel. Here you need to find out whether your device is listed under USB devices. If not, then you'll have to manually download and install the correct drivers of your phone. After a restart,

you should be able to see your device. Other than the software issue, the problem could also be a faulty USB cable or port. Do try with another cable and also on a different port on your PC.

## Delayed notifications

Hi guys. My iPhone 5s restarts on its own and the SKOAR! Page notifications are delayed, almost half an hour. The internal storage has a lot of empty space available and I get 4G speeds on the phone. How do I resolve this problem? Do I need to update or downgrade to a different iOS version?

—Abhimanyu Chauhan

**A** Hey Abhimanyu, looks like the software version of iOS installed is causing these errors. You should try to either upgrade to the latest version available for your phone or roll back to the previous version. The automatic restart bug might get resolved this way. Regarding the late notifications, since it's not your Internet connection, it has to be because of the Facebook app. Do take a look whether the app is updated.

## SystemUI crashing

I have a Samsung Galaxy S Duos 2. It's three years old and whenever I long press the middle button to close all applications, it shows System UI stopped working. Please help me.

—Harshit Chouhan

**A** There could be many reasons for the System UI to crash, especially rooted phones. If the problem arises only when you long press to close applications then it's an issue in the desktop itself. If



## The Swift robotic arm

The Swift is a crowdfunding robotic arm that can perform tricks like laser etching, light painting and simple assembly. <http://dgit.in/SwiftArm>

Q&A

you have rooted your phone and installed a custom ROM, you'll have to flash the SystemUI.apk file from the ROM files. If your phone isn't rooted, check whether your device has a software update lined up. If all else fails, take a backup of your files and factory reset your phone.

## System info mismatch

I recently purchased a Lenovo IdeaPad 310 laptop. It has 4GB of DDR4 RAM. I can't use Google Chrome and Microsoft Word simultaneously. Even when no program is open, the memory usage is around 50%. I experience some occasional lag. I thought about upgrading my RAM but I don't know the maximum memory it supports. I ran a system detector program on Crucial's website. The tests showed the maximum RAM supported was 20GB. But in the Lenovo forums, there were discussions about only 8GB being the maximum RAM.

Also, I don't know how many memory slots my laptop has. There have been many conflicting reports. In the



SystemUI.apk crashing

the device's warranty claim. Your best way would be to contact customer support and notify them about the erroneous memory usage. 4GB of RAM is enough, at least to run Chrome and Word simultaneously.

## Gaming laptop

My PC configuration:

- Intel E6700 3.20 GHz
- Zotac NVIDIA GTX 750 2GB

- RAM: 4GB DDR3 1333MHz
- Windows 10

My PC has slowed down suddenly. I scanned my PC using Malwarebytes that you gave on your DVD. It did remove some of them but still the PC is very slow. Please help.

—Vinay Sharma

Hey, since your CPU is quite old, certain applications might slow down your PC. If your PC keeps slowing down regardless then it's probably something running in the background. Open up task manager and try to locate which application is taking up



## Sudden rise in memory usage

task manager I, see 2 slots, but on the Crucial system detector test it shows only one slot. Please Help!

—Vinay Bomma

Hey Vinay, the best way to determine the number of memory slots would be to open the laptop. The problem would be that this will break

more resources from your CPU. If you find a suspicious process tasking your CPU, you should remove it as soon as you can. Run a full system scan with an antivirus to be sure. You can determine more about the problem by booting into safe mode and checking whether your PC slows down in a restricted boot.



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## macOS SIERRA

Mac users got the option to update to the latest macOS Sierra, late last year. If you haven't yet updated your system, you can search for "sierra" on the Mac App Store and download it! Sierra brings security updates and other miscellaneous features, the main attraction being Siri. Read on for getting the best out of your Mac:



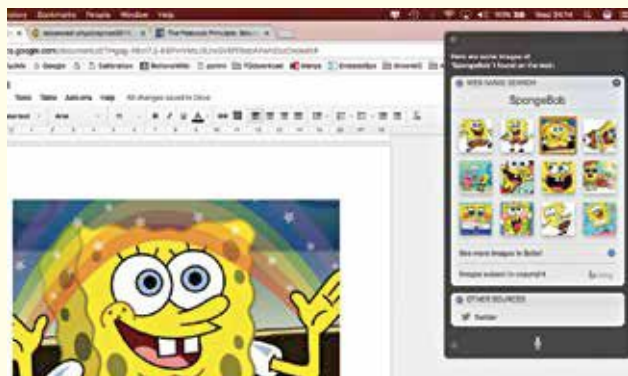
### Siri - Save search results

Siri's default shortcut is cmd+space, and once you've committed that to memory, you'll be calling her up for every stray thought, and why not? She's there, she's not a person. Use her.. Er, it. Whenever your stray thoughts get too distracting, you can save Siri's search

results for later by clicking the small + sign on the top right. Later, find it in the Notification Sidebar.



Information can be searched without opening a web browser



Images can be easily dragged and dropped using Siri



|                     |    |
|---------------------|----|
| macOS Sierra.....   | 10 |
| Dropbox Paper ..... | 12 |

*[ 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. ]*



### Siri - Image drag

Siri is a very cool multitask enabler as you no longer have to open a new tab and google, or quit your work to send a tweet/text. Once you've set up a shortcut, she's at your beck and call. You can ask her to search for images, whether from your computer or the web, and when she delivers you can directly drag and drop them into the program in which you're working! Apple is actually making our lives pretty convenient!



### Siri - Make her your Mac manager

Siri can now do a lot, like, tell you about your Mac. Go on.. ask her how fast is your computer! For more useful stuff, you can ask her to remind you things based on your location, like by saying "Remind me to take out the trash when I get home." She can also mute your Mac or adjust your screen's brightness. All this while speaking like you would to your slave. The version of Siri that comes with Sierra can even retrieve



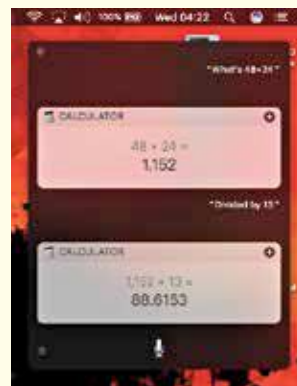
Ask Siri for literally anything

files on your computer, so put that to good use!



### Siri - Chain Queries

Siri on the Mac is even better than before as it can handle sequential queries while maintaining context. This means you can ask questions more like a human. For example, if you first ask "Do



Use the calculator using just Siri commands

I have Abhi in my contacts?" and then say "Send him an email", Siri will 'understand' that you mean Abhi. We'll leave it to your imagination to find more use cases, but rest assured you cannot do any magic tricks that start with "Think of any number."



### Play videos and preview links from messages

Sharing content with your friends got a lot more fun

with the Sierra update. The live preview feature works as soon as you paste in a link so that there is no need to open a separate browser window to view the link. Similarly, video links show a preview, albeit with simplistic controls. You can even double click on the video preview to give a reaction to the video. Yay, fun.

is automatically done for you. Emptying the trashcan automatically is also recommended. May not be much, but it's something. Lastly, you get the option to review your largest and oldest files. If you see things you don't need, out with them and say hello to some storage space!



## Free up space using Optimised Storage

If you're consistently low on space on your Mac, you may want Sierra to help you out. Click on the Apple logo in the Menu Bar, then go to About This Mac > Storage > Manage. Here you will find four options to help you save space. You can store some files in iCloud if you have space there, and select Optimized Storage so that some cleaning



## Use PIP to multitask while watching videos

Ever wanted to watch a video while doing something else? Sierra supports a new feature called Picture in Picture. If you're browsing a video website on Safari, this feature allows you to continue watching the video in a minimized box in the corner of your screen while you carry on with your work as usual. On Vimeo you can directly



There are few features in Sierra to help you go easy on storage



PIP mode enables more multitasking



Selecting Optimised Storage helps you save free space

click the Picture-in-Picture icon in the toolbar, whereas on YouTube, you have to right click twice and select the appropriate option.



## Have more fun with the Photos App

A bane of the Mac's Preview application is the inability to view a simple slideshow from a collection of pictures in a folder. But fret not, when you do things the proper way (importing into Photos) Sierra delivers a lot more! The Photos app is revamped with better AI that helps you automatically categorise your clicks in the Memories tab, from where you can make slideshows and whatever else tickles your fancy. The AI sorts through thousands of your photos to recognise more than 4,000 different objects and seven facial expressions so you can search for precisely what you want, just like Google Photos, but without the unlimited storage facility.

on the cloud while viewing them as you normally would. Head to System Preferences > iCloud, make sure iCloud Drive is activated and click on Options next to it. Select the checkbox next to Documents and Desktop Folders and soon your files will be moved to the cloud for you, while being accessible exactly as before!



## Watch unlock

With macOS Sierra there is no need to type in your long passwords anymore if you own an Apple Watch. Setting this up is a three-step process. First open System Preferences > iCloud > Account Details > Security and make sure Two-Factor Authentication is turned ON. Next, set up a passcode for your Watch from your iPhone > Watch > My Watch > Passcode > Turn Passcode On. After you set the 4 digit PIN, back on your Mac go to System Preferences > Security and Privacy. There, Uncheck 'Disable Automatic Login' and Check 'Allow your Watch to unlock your Mac'.



## Intuitive iCloud

Whereas iCloud previously had a dedicated folder à la Dropbox where you stored and viewed your files, now you can have your Documents and Desktop stored



## Use tabs to switch between windows of the same App

Juggling work across multiple windows and having to flip





back and forth is one of the reasons people go to anger management therapy. That's why browsers have had tabs for quite some time now, for the simple reason that they make life easier. Now macOS Sierra brings this window management functionality to some other applications as well. When you have more than one window of say, Pages, open, with Pages in the foreground, on the Menu Bar, go to Window > Merge All Windows. All the Pages windows will coalesce into a single window with multiple tabs. No more foreground background window shuffling! Feel the shanti..

## DROPBOX PAPER

For years, Dropbox has been an online storage service, offering free as well as premium cloud storage. Their new and second product is a team-collaboration tool intended to make collaborative projects easier. Simply called Paper, it isn't as powerful as Google Docs but better than what Medium

looks like. What you get with Paper is a rich text editor that lets you embed images, web links and videos. You can also enjoy collaborative features such as tagging your teammates, assigning tasks and creating comment threads. The following tips and tricks will help you understand all the features present in Paper and how you can put them to use.

### Embedding rich media content

You can add links from rich media content such as audio clips, videos and GIFs, and they will get embedded in the doc. You can add SoundCloud clips to the doc, and an embedded version appears. The same can be done for videos from YouTube and Vimeo. Embedding enables you to play audio and video clips right inside the doc rather than having to visit an external link.

You can embed tweets as well. All you need to do is copy the tweet's URL and paste in the doc. It automatically cre-

ates an interactive tweet in the doc, revealing all the details about the tweet. You can also add Pinterest boards in the same way and scroll through them right inside the doc.

### Tag teammates

As it's meant to be a collaborative service, you can share the doc with your teammates through email. All they need

'@' that shows you a list of all your contacts and you can select the relevant member. This will let you instantly share the current doc using the pop-up window.

### Creating task lists and assigning them

Inserting comments is easy. Either you can highlight the text and select the last icon



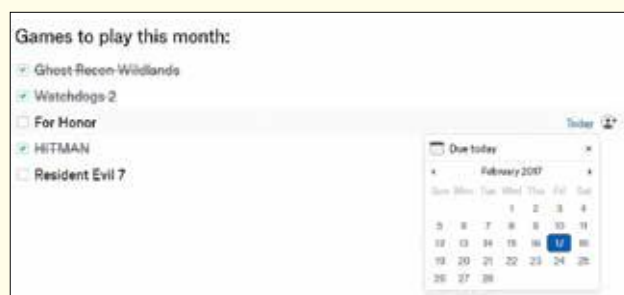
Tagging your teammates has never been easier

to do is register into Dropbox with their email ID and they can start contributing right away. Once you give Dropbox access to your email account while signing up, all your contacts will be synced. To tag teammates, you can type

on the right. Or you can hover your mouse on the right side of the document's margin and click on the comment bubble. Apart from adding comments, one feature present in Paper which isn't there in Google Docs is



You only need links to embed them



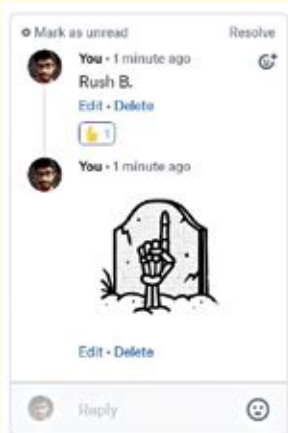
Create task lists for yourself and your teammates

| Movie                              | Release Year |
|------------------------------------|--------------|
| Episode IV: A New Hope             | 1977         |
| Episode V: The Empire Strikes Back | 1980         |
| Episode VI: Return of the Jedi     | 1983         |
| Episode I: The Phantom Menace      | 1999         |
| Episode II: Attack of the Clones   | 2002         |
| Episode III: Revenge of the Sith   | 2005         |
| Episode VII: The Force Awakens     | 2015         |
| Episode VIII: The Last Jedi        | 2017         |

Paper allows you to insert and adjust tables as well



creating task lists. You'll be able to assign tasks to your teammates and include a due date as well. To create lists, highlight the text and click on the 'Task List' option from the hovering menu. As you keep on adding tasks, you can assign a task to a team member by using the tagging method mentioned previously. Now, you can add a due date by hovering your



You can react to comments with stickers and emojis

mouse over the task and selecting the date. Do note, Google Docs also includes the feature to assign tasks.



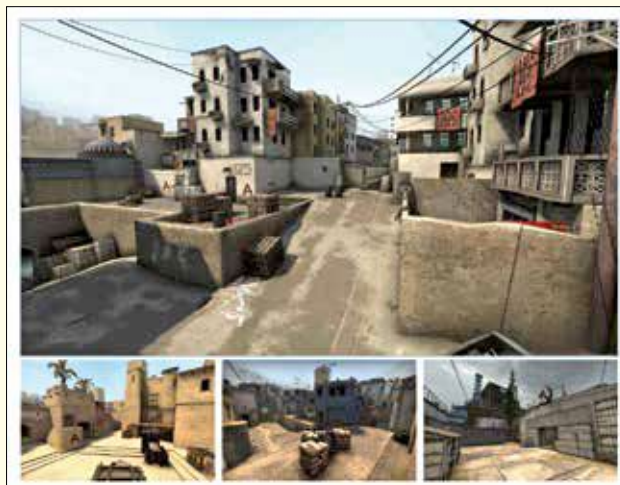
### Insert tables

Tables can be inserted by clicking on the plus button appearing on the left side of the doc. By default it adds a 2x2 table that can be increased by hovering the cursor over the dots and dragging extra rows or columns. The width of the cells can be easily adjusted according to your preferences. To delete the entire table, click on the top left corner of the table and click the delete icon.



### Add, react with, emojis and stickers

Rather than adding an entire sentence to express your



You can upload multiple images and create a grid using Paper

reaction, emojis make the job easier. You can add hundreds of emojis in the doc by typing ':' which pops up a scrollable mini-window of numerous emojis. If you aren't sure where a particular emoji is located, you can type out the expression followed by the colon. For example, if you want to add an angry emoji, type ':angry' and all the angry emojis will be filtered in the window. You can react to comments with emojis too by clicking on the comment and then clicking on 'Add reaction'. This will show the same emojis, the difference here being that you can't type.

Stickers are available in Paper in the comment section. To add a sticker to a comment, select a comment and click on the bottom

right emoji. You'll see seven sticker packs with many stickers inside them that can be easily added.



### Create image grids

Adding images wasn't a problem in Google Docs, but

you to display more images at a time. This also makes it easier to discuss design ideas with your team, rather than making them visit other websites via image links. You can upload an image from your computer and if you want to create a grid of similar photos, you have to select multiple images. It will automatically scale and form a grid in the doc. You can change the look of the image by moving to the right or left of the text, just like in Medium. Commenting on images is allowed and all the images can be viewed together as a slideshow by clicking on the image.




### View as a presentation

After you're done adding all the details required in your doc, including text, images,



You can embed videos from Vimeo as well

you had to add them sequentially. Paper allows you to create photo grids enabling

video links, table of data, etc., you are now ready to show it to your team before you start collaborating with them. Paper includes an in-built presentation feature that removes the unnecessary menus from the UI and keeps only the content visible. You can jump into Present mode by clicking on the three dotted menu at the top and going to Present. A new tab opens up which lets you invert the colours of the text and background, and then you enter fullscreen mode. 

| Star Wars                          |              |
|------------------------------------|--------------|
| Movie                              | Release Year |
| Episode IV: A New Hope             | 1977         |
| Episode V: The Empire Strikes Back | 1980         |
| Episode VI: Return of the Jedi     | 1983         |
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| Episode II: Attack of the Clones   | 2002         |
| Episode III: Revenge of the Sith   | 2005         |
| Episode VII: The Force Awakens     | 2015         |
| Episode VIII: The Last Jedi        | 2017         |

You have the option to invert colours in Present mode



# Time Crystals

## Completely warping our idea of time and energy

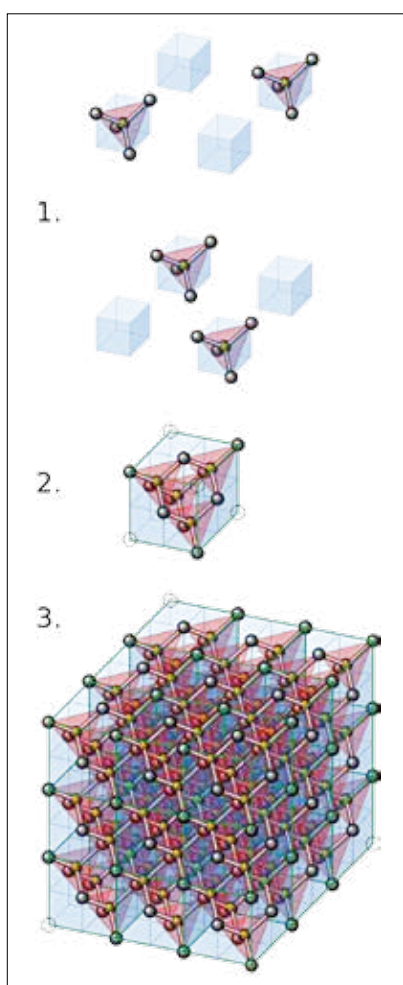
Can you run to and fro without expending any energy?

Well, Time Crystals can.

Ronak Gupta  
[feedback@digit.in](mailto:feedback@digit.in)

Fancy theories are commonplace in physics, but when a Nobel Laureate comes up with one, they are taken seriously. In 2012, Nobel Laureate Frank Wilczek hypothesised the existence of a type of material called 'time crystals'. Initially, they seemed to defy the laws of physics. Recently, these mysterious time crystals have been constructed in a laboratory – giving credence to Wilczek's bizarre proposition. In this article, we breakdown time crystals – why are they weird, how were they created and what can they mean for the future of physics.

When it comes to the laws of physics, symmetry is sacrosanct. Laws of physics are 'spatially' symmetric, as in no position in space is more favoured than the other. What if these symmetries are broken? Indeed, spatial symmetry breaking does happen often in nature. The gravitational force that binds the earth in orbit around the sun is spherically symmetric – not having any directional dependency, depending only on the distance between the two bodies. The motion resulting from this force however breaks symmetry by executing elliptical orbits which aren't symmetric about its axes, unlike a sphere. This is an example of symmetry breaking in an 'excited' state of energy. More interesting is the case of symmetry breaking in the ground (lowest energy) state of the system, and this happens in the case of crystals. Crystals, like diamond, have lattice structures which repeat in space. They show discrete symmetry and periodicity



Visualisation of a diamonds lattice. Repeating structures are clearly visible

which violates the above equivalence of space principle accorded by spatial symmetry. Now, the laws of physics are also symmetric in time, which disallow stable objects to change form over time. Thanks to Einstein and co-workers, we are used to unifying space and time into a single four-dimensional space. So, if spatial

symmetry can be broken, can there be cases where temporal symmetry breaks?

Time crystals do exactly that. The molecular structure of a crystal forms a pattern in space by repeating itself over regular intervals. The same way, time crystals 'repeat' structures over time intervals. What does time symmetry breaking mean? How does it manifest itself? Think of a body attached to a perfect spring dangling in frictionless air. If we perturb this system by slightly pulling the string, the body will execute a periodic motion in time, returning to its original position regularly. If drag was there, this periodic motion would die down and the body would come to rest. This periodicity in time is nothing special and plenty of systems execute such motion. Periodic motion is not symmetric in time, but such a motion does not count as time symmetry breaking. This is because most periodic motions are associated with some inherent energy. When we perturbed the spring by tugging at, we gave it some potential energy, which keeps getting converted into energy of motion and vice versa, keeping the system in a state of constant energy. Would the block do the same motion without the initial tug? Can a system have time periodicity in a state of zero or lowest energy? The answer is yes. When there is a time repeating pattern in the system at ground state – it indicates breakdown of time symmetry. Time crystals keep oscillating in time and here's the clincher. The oscillation occurs without any energy.

Imagine a collection of ions arranged in the form of a ring. If we cool them down to a temperature close to zero, the



### 3Doodler Kit & pens

New Star Trek and Powerpuff Girls-themed pens and also a new robotics kit on the way. <http://dgit.in/3doodlerKit>



### Rare Carat's new chatbot

Price transparency website for consumers buying jewellery adds new Watson-powered chatbot. <http://dgit.in/CaratWatson>

From the labs

ion system reaches its ground state – a state of equilibrium. Intuitively, one would imagine that this system doesn't show any motion, similar to how the block and spring system wouldn't in the absence of disturbance. Although, if we throw in time symmetry breakdown into the mix something weird can happen. The ions can start rotating in the ring in a perpetual circling motion. The breakdown of spatial symmetry manifested into a repeated pattern in space for crystals. Similarly, a time symmetry breakdown would create periodicity of motion in time. While this might sound



Nobel Laureate Frank Wilczek who first came up with the idea of time crystals

like a perpetual motion machine, it really isn't. In this case, the ions do move around in a loop, perpetually, but this movement doesn't extract any energy from the system even in the ground state. The formidable law of conservation of energy also states that since there is no usage of energy there is also no energy available to extract for work. This ring-shaped crystal arrangement was one of the first feasible experiments postulated to create time crystals and was published along with Wilczek's original paper in 2012. The method works in theory, but there are some practical difficulties.

For one, quantum systems in equilibrium show no dependency on time and thus it is impossible for them to show any periodicity as well. To get around this, it was suggested that time crystals be created in a 'non-equilibrium' state, where a system is constantly driven by some periodic source. To keep the system from absorbing energy from this source, the constituent ions in the system had to be controlled such that they remain localised and not

smearred out as the laws of probability for quantum particles dictate. A recipe based on the above considerations was suggested last year and two teams independently followed it to create a time crystal in the lab.

One of the teams from the University of Maryland used an array of ten ions, electrons with spins. Then they bombarded the system with two laser pulses timed with precision. One pulse created a magnetic field and the other flipped the electron spins. Because the system of electrons is interacting and spins are in a quantum entanglement (to put it simply: a change in one spin affects the other), this system settles into a state where the spins change periodically in space. This results into the spontaneous breaking of the spatial symmetry. As a simple picture, imagine a row with ten seats. The person on the first seat faces the movie screen, and the adjacent one faces away. This arrangement has the sort of repeating quality common to a crystal in ground state. Now after a time period, this arrangement switches and each individual changes the direction he is facing. After another interval, the system reaches back to its first state again. This signifies breakdown of time symmetry. Not only does the ion system behave like a crystal in space, but also oscillates back and forth in arrangements, in time. What is even more surprising is that if the period of the laser pulse driving is  $T$ , the arrangement of spins in the ions oscillates in time with a period of  $2T$  – a behaviour that is impossible to occur in a normal system. Furthermore, on changing parameters

of the driving pulse, the system remains in time oscillations with period  $2T$ . Since there is no driving force with period  $2T$ , the only way the ions could oscillate with that period is by breaking time symmetry. Voila, a time crystal!



### TECHNICALITY IS TOO DAMN HIGH

This might sound like technical gibberish but it's a

huge experimental achievement. What scientists have demonstrated is the existence of a new phase of matter, one that is never in equilibrium. A ground state of energy, carrying out a perpetual oscillation was believed to be impossible. How can a system move back and forth without using up energy? Until now, no one had broken the old guard of time symmetry. Now that it has been done, it opens the doors to some new, radical research. For instance, devices operating at the quantum level have a life time limit due to a phenomenon known as 'decoherence'. This phenomenon is responsible for bringing a quantum system back to a classical state – where it is ruled by the laws of classical mechanics. For quantum computing devices, this is an undesirable effect. Time crystals can potentially lead to devices that are stable against such effects, enabling better memory and computing devices for quantum computing applications. At a more fundamental level, since time crystals are an example of never seen before time symmetry breakdown, an experimental realisation is likely to provide scientists with access to states of matter that could only be theoretically possible in such systems. The fact that time crystals present a time based analogue to ordinary crystals that exhibit spatial symmetry breaking, indicates that maybe time as a concept must be unified with the fabric of space, something that current quantum mechanics doesn't feature. In conclusion, we are at the cusp of some great discoveries which in the long run can alter our understanding of not only the standard states of matter, but the fundamental concept of time itself.







### Medical imaging chip

Researchers have developed a powerful pint-size millimeter-wave signal generator. <http://digit.in/pintChip>



### Nintendo Switch stolen

Nintendo claims that a Switch device that was used in a hands-on video had been stolen from a distributor. <http://digit.in/Switchsteal>

# 104 NOT OUT! ISRO'S PSLV-C37 MISSION

The complete lowdown of a historic Indian space milestone that everyone is talking about

Shubhankar Dattagupta  
[feedback@digit.in](mailto:feedback@digit.in)

**O**n February 15, 2017, India made its entry into the books of yet another world record in space missions. The Indian Space Research Organisation (ISRO) executed a successful PSLV C-37 launch mission, involving the deployment of a staggering 104 satellites into space. Starting off its journey at India's spaceport in Sriharikota, Andhra Pradesh, the payload included three Indian satellites, along with 96 American, and a satellite each from Israeli, Kazakh, Swiss, Emirati & Dutch organisations. The entire payload weighed around 1,378 kilograms. The previous record of 37 satellites by the Russian Dnepr rocket set back in June 19, 2014 was decimated in massive proportions. The PSLV-34 also left behind its own previous record set in 2016, by more than five times, standing with a payload of 20 satellites. The success of the mission attracted praises from across the globe. Revered spaceman and SpaceX founder, Elon Musk, also joined in to acknowledge the "impressive" achievement. It was a wonderful sight to witness the team of scientists momentarily leaving behind their otherwise stern and focused state to a group of overjoyed kids celebrating their pioneering success.



The PSLV-C37 sits on the First Launch Pad at the Satish Dhawan Space Centre - calm before the Storm

### PSLV

Launching 104 satellites to space is no joke and there's no extra points in guessing what took over this responsibility from ISRO's arsenal of launch systems. As expected, the venerable Polar Satellite Launch Vehicle (PSLV) was chosen for this mission. Already basking in the glory of numerous successful missions, the recent PSLV launch makes it a total of 37. India was facing a serious communication gap during 2011 with demands growing as satellites neared towards the end of their operational life. The unavailability of spare transponder capacity pushed the launch of the GSAT-12 satellite. One motivating factor behind this launch was the inability of the European Arianespace SA which is

usually the launch provider for communication satellites. This resulted into some rejigging of the PSLV for a "fast track" mission, launching to the higher Geostationary Transfer Orbit (GTO). Consequently, on July 15, 2011, the PSLV-C17 mission took off with the GSAT-12, delivering yet another flawless performance, mitigating the crisis. Encouraged by the PSLV's performance and success rate, satellite makers from 23 countries have bestowed their faith on ISRO so far.

The PSLV programme was conceived in the 1980s towards the country's first attempt to develop meaningful Space Transportation System (STS). The 70's and 80's witnessed the development of the Satellite Launch Vehicle 3 (SLV 3) and the Augmented Satellite Launch Vehicle (ASLV), eventually building up a repository of institutional knowledge in rocket and space technology. Years of experience helped setup the physical infrastructure required that made the latest achievement possible.

Reaching the polar Sun Synchronous Orbit (SSO) – 600-1000 km over the Earth surface – was the prime objective of ISRO's PSLV project to launch its Indian Remote Sensing (IRS) satellites. This is a very crucial orbit, in consonance with ISRO's mandate to harness space for socio-economic development. With the PSLV in its arsenal, India possesses the capability of launching its own remote sensing "observation" satellites. The wide range of its functions include weather monitoring, tracking forest cover, determining fish density & discovering deposits of natural resources.

Data from ISRO's Oceansat-2 satellite enabled meteorologists to gauge super typhoon Haiyan's severity & path,



### Magic Leap raises \$1.4B

Magic Leap, the augmented reality startup acquires a 3D division of Dacuda, a computer vision startup of Zurich. <http://dgit.in/McLeap>



### No cheap HTC phones

The Taiwanese smartphone maker announces that it will exit the entry-level smartphone market later this year. <http://dgit.in/HTCcheap>



Beaming Kazakh Students with their AI-Farabi-1 Satellite - on top of the world, already!

days before it struck the Philippines in 2013. Described as one of the "most intense tropical cyclones on record", evacuation and rescue efforts can be geared up accordingly. ISRO also holds the distinction of operating the world's largest constellation of remote sensing satellites – 15 satellites, serving the nation from the SSO.

The PSLV has a 4-stage design. Broadly speaking, it includes four groups of rocket engines operating in succession to propel the payload into space. When the Stage I engine completes operation, it detaches & falls off with Stage II kicking in, and so on. This ensures no dead weight travels upwards and each stage of the flight can be powered by an engine suited to that flight profile. While the second and fourth stage of the PSLV is liquid-powered, the traditional solid fuel continues powering the first and third stage.

### Satellites

The ISRO-built Cartosat-2D satellite was the mission's queen bee. Weighing 714 kg, its cameras are capable of capturing clear images at a resolution of 0.65 m. Announced prior to its launch, through its five year design-life, its imagery serve for cartographic, urban and rural, coastal land use and regulation, utility management like road monitoring, water distribution, creation of land

use maps, geographical and man-made features detection, and various others including Land Information Systems (LIS) and Geographical Information System (GIS) applications.

Other than the Cartosat-2D satellites, there are two additional Indian satellites – the INS-1A & INS-1B observation satellites. Designed to last six months, they have been built upon a completely new bus system – the ISRO Nano Satellite (INS) bus. A satellite bus system is like an application SDK, providing the physical & specification framework around which builders can develop their application-specific satellites. Besides simplifying satellite-building, they introduce standardisation to further simplify the launch process. Traditional ISRO developed bus systems have been geared towards satellites weighing above 1 metric tons – I-1K, I-2K, I-3K & I-4K. New fabrication technologies have miniaturised components to an extent where satellites weighing tonnes have now scaled down to kilograms, exhibiting better performance. In fact, the Google Nexus One smartphone was powerful and fast enough to be used on the British STRaND-1 satellite launched by, you guessed it, ISRO in 2013.

Availability of a system like the INS Bus would go a long way in encouraging greater participation by R&D labs

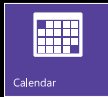
in space activities. They now have a platform to devise their own interesting experiments. No longer will they be dependent on big satellite builders to allocate some of the sparse on-board real-estate. To put things into perspective, one of the microgravity experiments designed on the Swiss DIDO-2 Nano-satellite, also known as CHEN Jiayong-1, is studying the "formation of a drug in a microfluidic device". This will ultimately lead to the development of 3D-printed medicines in future. In the foreseeable future, it could become a common occurrence for privately managed PSLV launches to deploy scores of such Nano-satellites every month. Aims to democratise space just got a big boost.

All said and done, this record is solely attributed to the launch requirements of one participating American company – Planet Labs Inc. 88 of their Flock-3P Nano-satellites or 'Doves' were part of the mission, now orbiting the Earth. With its constellation of 100 operational Doves, it now claims the ability to photograph the entire Earth every day. This San Francisco-based company in fact, is an old customer. During last year's PSLV-C34 mission, ISRO had launched Planet Labs' first 12 satellites.

The other American Company, Spire Global, Inc., too has returned to ISRO to launch its eight LEMUR satellites.

| PSLV Variants and Payload capability |                                  |                                  |                                       |                                    |                         |
|--------------------------------------|----------------------------------|----------------------------------|---------------------------------------|------------------------------------|-------------------------|
| PSLV VARIANTS                        | PSLV                             | PSLV-CA                          | PSLV-XL                               | PSLV-HP                            | PSLV-3S                 |
|                                      |                                  |                                  |                                       |                                    |                         |
|                                      | BASE CONFIGURATION               | CORE ALONE VEHICLE, NO STRAP-ONS | PSLV WITH EXTENDED STRAP-ON (PSOM-XL) | PSLV-XL WITH HIGH PERFORMANCE PS4  | PS2 & STRAP-ONS REMOVED |
|                                      | (S59 + S139) + PL40 + HP33 + PS4 | S139 + PL40 + HP33 + PS4         | (BS12 + S139) + PL40 + HP33 + PS4     | (S512 + S5139) + PL40 + HP33 + PS4 | S139 + HP33 + PS4       |
|                                      | LEO                              | 3200                             | 2100                                  | 3800                               | 4000                    |
| SSPO (822 Km)                        | 1600                             | 1100                             | 1750                                  | 1900                               | -                       |
| GTO (246 x 24000 km)                 | 1150                             | -                                | 1300                                  | 1440                               | -                       |





## Outlook with Alexa

Amazon has silently updated its Alexa assistant this week to add support for Outlook.com. <http://dgit.in/outlookAlexa>

## Lightlines for phone addicts

A city in Netherlands has reportedly been testing "Plus Lightlines" to alert distracted phone users at road crossings. <http://dgit.in/lightlines>



Cartosat-2D undergoing Solar Panel Deployment Test

Utilising Satellite-Automatic Identification System (S-AIS) technology, Spire provides its customers with the ability to track down the location of their shipping vessels in the open seas.

Debuting with ISRO on the other hand are Kazakhstan and the UAE. They have already tasted space success with their satellites Al-Farabi-1 & Nayif-1 respectively. These student built satellites are serving as the test-bed for understanding technologies associated with satellite-based observation and communication. This is their first step towards bigger goals.

The BGUSat (Israel) & PEASSS (the Netherlands) satellites are among the ones validating newer technologies of material, navigation & power-supply for future space sojourns.

### The launch

To protect the Nano-satellites from damage during launch turbulence, they were each housed inside a protective casing. A Quadpack CubeSat Dispenser accommodates up to four satellites.



The array of 25 Quadpack Dispensers, protecting the 96 Nanosatellites placed within it

Each dispenser was mounted in a carefully calculated angle on the PSLV along with the larger Cartosat-2D and two INS satellites. A protective heat shield also known as the Payload Fairing, covered the satellites.

Upon exiting the Earth's atmosphere, the Fairing parted ways to prepare the satellites. The PSLV first released the Cartosat-2D.

The system implemented a combination of measures such as rocket manoeuvring the Stage IV trajectory and orientation of the mounted Quadpack. Later, the Nano-satellites finally emerged out of the housing, safely floating out into space at regular intervals. Within a span of 1,722 seconds from launch, all the satellites were deployed establishing a new space milestone.

### Future

India's space scene is witnessing an exciting churning. Encouraged by ISRO's success, private enterprises have begun foraying into this burgeoning sector. The most famous would be Bengaluru-based Axiom Research Labs' TeamIndus. Shortlisted for Google's Lunar XPRIZE, they are preparing to launch their own Moon mission on the PSLV in 2018. Lesser known, but perhaps far more ambitious is Bellatrix Aerospace, that plans to develop its own family of launchers. Together with the others, like Earth2Orbit, Dhruva Space and Applied Research & Development Laboratories (ARDL),

a momentum is gradually building up towards the liberalisation of space expertise. Established Indian businesses supplying space sub-systems to ISRO are moving towards expanding scope of their involvement. This ecosystem could inspire a large number of interested graduates to explore this sector and probably reform education with relevant additions.

As ISRO shares its goals and requirements, it would be beneficial to the existing and emerging companies as well in pursuit of achieving bigger goals with national interest. Recently, a reusable launch vehicle – Technology Demonstrator [RLV-TD] concept was flight-tested in an attempt to reduce operating costs in the future. Similar to the erstwhile American Space Shuttle, it would enable ISRO to undertake repeated space missions using the same launch vehicle – tank-up, launch, deploy, land, repeat.



Israeli BGUSat Satellite being put inside a QuadPack CubeSat deployer

ISRO is heading towards developing a full spectrum of indigenous launch capable rockets. It's already spear-headed by the Geosynchronous Satellite Launch Vehicle (GSLV) series and plans are underway to evolve a Unified Launch Vehicle (ULV) & Heavy-lift Launch Vehicle [HLV] concept. Dependability and cost-effectiveness are its USP and eventually India could find itself in an enviable position in the highly monopolised launch industry. Minus Geopolitical machinations, India has the potential to emerge as the numero uno destination for countries looking for some space. It's the country's responsibility to stay focussed, play its cards right to ultimately achieving pure space glory. **d**





## Mammoth de-extinction

4000 years after extinction, a Harvard-led woolly mammoth/elephant hybrid might actually make a comeback. <http://dgit.in/WollyBack>

## Nvidia and Japan colab

Nvidia is supplying Tokyo Institute of Technology the GPUs that will power the country's fastest new AI supercomputer <http://dgit.in/JapanAI>

# Amazon Internet Services bets big on AI

**Bikram Bedi, Managing Director, Amazon Internet Services Pvt. Ltd talks on AI in the cloud**

Soham Raninga  
editor@dgit.in



**Q AWS re:Invent 2016 saw a flurry of new announcements in terms new products and upgrades to the existing portfolio, which of them would you put as the most significant from customer interest, specifically in the Indian context?**

**Bedi:** At re:Invent we announced a lot of new services. The ones that are really important for us and are generating a lot of interest from customers would be the services and products that we launched in the Artificial Intelligence space. If you look at AI - Automatic speech recognition, natural language understanding, computer aided vision, image recognition - all of them need some complex machine learning algorithms and large amount of compute capabilities to crunch all the data. So, as an individual developer, one would need to dedicate lot of time and resources to develop this ground up. With our AI initiatives, we are giving developers and startups scale-able solutions around AI along with security, so that developers can focus on creating core applications and their business models instead of worrying about developing AI capabilities from ground-up. Another advantage with our AI services is the pricing. The investment needed to use AI services is directly linked to the scale and does not require huge sums of development expenses. AI is no longer about a few people with lots of money; now even an individual dev can harness the power of AI to make smarter applications.

**Q Indian customers are positive about these new AI based offerings?**

**Bedi:** Yes, absolutely. We are seeing



Bikram Bedi, Managing Director, Amazon Internet Services Pvt. Ltd

a lot of interests from banks, travel companies and of course internet based startups. Anybody who is looking to interact with their consumers in a more meaningful way would be interested in our AI offerings. For example, with Polly - our text to speech conversion engine - you don't need customer representatives to answer calls, you can simply use the engine to convert text responses to speech.

**Q Amazon LEX is one of the AI services that offers speech recognition. But there are variations in terms of accents and pronunciations that differ from country to country. So, are you customizing voice engines to understand local languages?**


**Bedi:** Absolutely. We understand the nuances of working on the voice recognition space. For example, Polly supports 24 languages and 47 voices, which includes Indian English. We are continuously localizing our AI engines. We have also been doing a lot of AI and machine learning, at Amazon.com.

**Q Lightsail is another brand new product that was announced at re: Invent 2016. It targets a completely new segment that Amazon Internet**

**Services is entering. Can you tell us more about it?**

**Bedi:** Lightsail has particularly seen a lot of excitement in India. If you are building a basic virtual private server to run some specific experiments and tests, what you need is a solution that starts low in terms of cost but with an ability to scale up if the need arises. Lightsail starts at 5\$ a server, it's a low-end offering and has seen a lot of interest in the Indian market. There are quite a few players in the market with similar offerings, but Lightsail offers a very distinct advantage: it offers inter-connectivity with other AWS services. So, with Lightsail you can start small while having the ability to scale to larger AWS environments without having to start afresh.

**Q When it comes to building new services and offerings, is there a roadmap that Amazon Internet Services follows?**

**Bedi:** We don't have a particular roadmap that we get locked into. Unlike many traditional tech companies, that sort of get bound by the roadmaps, we approach the development of new services and features on basis of our interactions with customers. We constantly talk to our customers for feedback and 90% of our new features and services are based on what our customers are telling us. And we prioritize our product development cycle based on the feedback. For example, we run beta programmes with our customers, giving them access to latest tech and features and in return we get valuable feedback that goes into improvising and developing a strong final product. At Amazon, we firmly believe that launching a service is not the finish line. In fact, it's just the starting point, we engage with customers for feedback and recommendations to constantly improve the product. 

Full interview - <http://dgit.in/amznflintaws>

**Killer rigs**

This time around we have a build for design and video editing rigs, apart from our regular configs of course

**Recommended buys**

The very best products you can buy right now spanning across popular tech categories.



# Not another shutterbug

Agent001 comes to the rescue as another friend falls for the photography bug

Agent 001

[agent001@digit.in](mailto:agent001@digit.in)

**P**hoto Fairs are quite common in Mumbai, and with one of my friends having recently been to one, I was inundated with his questions about cameras. Needless to say, he was really taken in by all the marketing mumbo-jumbo and was all geared up to get himself a DSLR. With a click of a button he'd be able to take photos akin to the ones that the National Geographic magazine would put on its cover... or so he thought.

He wasn't the first to come up to me to ask about DSLRs, there have been countless others including many Digit readers who'd walked the path of DSLR photography. I zoned out the moment

he uttered the word 'DSLR'. There'd be one more @XYZPhotography Facebook page that I'd have to like. One more page filled with cringeworthy templatised photos reminiscent of every other Photography page ... oh the horror!

If you've ever had someone come up to you with a buying query then you'll know they want everything under the sun for 10 bucks and my friend was the same. While he had done a fair amount of research by himself about which parameters to focus on while buying a DSLR, there were areas where he'd misinterpreted a few things. And that was painfully evident.

I was snapped back to reality the moment he started listing out all that he wanted from a DSLR – good ISO performance, fast lens, great colour

reproduction, touchscreen display, a bajillion focus points, multiple kit lens, awesome built-in flash ... wait, WHAT! Firstly, no camera company in the world would ever come out with a 'Jack of all Trades' camera. That's bad business for them. Secondly, I had to stop him before he got around to saying his expected price point for all these features. He was bound to quote a price under ₹30K.

I asked him the same question that I ask most people when they come to me for camera advice – what's wrong with your phone? Smartphones these days have really good sensors and with a little bit of good composition anyone would be able to take good photos. Digit has even published a 'FastTrack to Smartphone Photography'. It goes

## Price watch

This time we bring you the latest prices for 4k TVs and Ultrabooks. Don't miss, if you've been planning to invest in these categories.



## Ransomware on business

As the technique evolves, Ransomware is becoming more directed towards industries and small businesses <http://dgit.in/RansomShift>


Agent 001

without saying that you aren't going to get DSLR quality images, nope, that's not going to happen anytime soon. I ask people to begin their photography journey on a smartphone for a very simple reason – to build interest. Every one of you know a few friends who have their own DSLRs which were only used for a month or two and then it's left to rot in some corner.

In order to not be another impulse purchase it's necessary for you to first learn the basics of photography like finding a subject and framing the same. Composition is an artform, that which makes your photo impactful. There are apps like Open Camera on Android which allow you to make the most of your camera sensor. You can play around with white balance, exposure and many more settings to gain an understanding. If, a month down the

line you have retained the same level of interest then you should go get a DSLR. Getting the hang of all the parameters on your phone will help smoothen the transition to a DSLR as most newcomers tend to get overwhelmed with the bevy of controls that a DSLR comes with and lose interest.


So what should a beginner get? I'd still say, you should follow the piecemeal approach. Start with the phone till it becomes incapable of giving you the right shots, then get an entry level DSLR like the D3300 or D5300 or the Canon 1300D with a kit lens. Once you get used to the DSLR, it'll be time to invest in more lenses. The first you'd want to get would be a 35mm prime lens which will further help you hone your composition skills. Since there's no zoom, prime lens make you move around the scene to get the right com-

position. After that you'll most likely want to get a 55-200mm zoom lens to increase the range of focal lengths for you to work on. If you get really good at photography, the first thing you'll want to do is move up from a cropped sensor to a full frame sensor. This means you'll have to sell off all your lenses (lenses have good resale value) and then you'll end up getting the holy trinity – 10-24mm, 24-70mm and 70-200mm. While a larger selection of lenses are always optimal, they're also a pain to carry so you need as few lenses that you can carry around without compromising on your focal range. This is where the holy trinity comes into play. And if you reach this stage in your photography hobby or career, I have zero qualms of liking your Facebook photography page. In fact, I'll look forward to the same. 

## The best budget in-ear headphones

Hello sir, I'm planning to buy a Skullcandy earphone. Please suggest me which model would be better within a budget of ₹1,000.

–Anoop


 Hey Anoop, we wouldn't recommend Skullcandy. Durability might be an issue. Skullcandy is mostly about looks. Instead you should go for the following:

- JBL C150SI
- JBL C100SI
- Brainwavz Omega
- Cowon EM1
- Cowon EK2

## Smartphone recommendation

I want to buy a new mobile phone. Which one would be the best between the price of ₹15,000 to ₹25,000? In terms of requirements, I need high RAM, high storage capacity, good camera, good performance and a good battery life. Please suggest me accordingly.

–Kishore


 The Lenovo Z2 Plus would be the cheapest and most balanced option for you. You can also go for the Asus Zenfone 3, for better battery and camera. The only setback will be compromised performance and a much higher price.

## Laptop confusions

Hello, please tell me which laptop is the best under ₹24,000? I want a laptop which has good specs under my budget. I'll be surfing the Internet a lot, especially YouTube. I will also do a little bit of editing for my videos but not very demanding. In terms of specs, it should have a 15.6-inch screen, 4GB of RAM and the latest quad-core processor, Intel or AMD. I'll also need Bluetooth and Wi-Fi connectivity, HDMI port, Ethernet port, VGA port etc.

I'm very confused because there are many laptop models on online sites. Please help me out in buying my first laptop.

–Shagun Khanna

 Hello Shagun, for a good laptop supporting all your requirements,




you'll have a increase your budget to at least ₹30k. Around that budget, you should go for the Lenovo G50-70. It's a great entry-level laptop that houses a 4th Gen Intel Core-i3 processor, 15.6-inch display, 4GB of RAM and 1TB of internal HDD storage. It also includes all the mentioned ports that you need.

## Chromebook curiosity

Hello Digit, I want to buy a Samsung Chromebook Plus or any Chromebook. What would you suggest?

–Prince Rayhan

 Hello Rayhan, since you didn't mention a budget we would recom-





## Brain scanning babies

New research finds out that brain scanning in high-risk babies during their first year can predict signs of autism. <http://dgit.in/BabyScan>



## Music with AI Duet

The latest AI experiment from Google 'Duet' is a music playing robot that can replicate piano keys. Learn more: <http://dgit.in/DuetAI>

mend the Acer Chromebook 14. Although it's expensive, it comes with a full HD screen and a strong processor, so you will be able to use it as your entertainment and work laptop. If you're tight on budget, then you could go for the Acer Chromebook 11. If you want more storage, you can go for the ASUS C301 that gives you 64GB of internal storage apart from the regular 32GB of storage.

### **Q** A laptop that can run games comfortably

Hey, please suggest me a laptop under 50K which can run CS:GO between 60-100 fps in low settings. P.S. I hate Dell.

—Adarsh Bagaria

**A** Hey Adarsh, under ₹50,000, you might not get a good enough gaming laptop. If the sole purpose of your laptop is to play games, then we would suggest you to push your budget to

something around 70k. This will let you play triple A titles in low to medium settings. If your budget doesn't allow you to cross 50k, then you could go for the Acer Aspire E5-574G. You get a 6th Gen Intel Core-i5 processor along with a discrete NVIDIA GeForce 920M graphics card. You'll also get a full HD 1920x1080 display and 4GB of RAM with 1TB of HDD storage. This laptop will let you run CS: GO easily at a minimum of 60 fps in medium settings.

### **Q** Finding the right lens for the right purpose

Hello Team Digit! I'm using a Nikon D3300 with the kit lens AF-S 18-55 mm. I wish to upgrade the lens with new AF-P 70-300 mm. Is this worth to buy? Kindly Help!

—Deven Jain

**A** Hey Deven, buying lenses apart from your primary ones should be



based on what you intend to capture. Since you're planning to buy a zoom lens, you also need to consider whether you'll be fine with a 70mm wide setting or whether you need a more wider setting. If that doesn't matter, then go ahead with the 70-300mm VR. This lens will let you take fast photos of subjects like cars or flying birds. Although, if you want a wider setting and just simple zoomed photography, then we would recommend the 55-300mm. Remember, that this lens performs poorly while zoomed into moving objects. **1**

## JUMP ONTO THE DIGITAL BANDWAGON

The Digit e-mag app is now listed on app stores

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**digit**  
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<http://dgit.in/DGTIOS>



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■ Basic rig = ₹32,832 ■ Entry-level gaming = ₹57,008 ■ Mid-range gaming = ₹79,681 ■ Basic Video Editing / CAD Rig = ₹1,73,561 ■ Ultra high-end gaming = ₹2,96,039 ■ Digit test rig = ₹5,37,588

## BASIC RIG

|                  |  |                |
|------------------|--|----------------|
| Processor        | Intel Core i3 - 7100                               | 9,935          |
| Motherboard      | ASRock H170 Pro4S                                  | 6,899          |
| RAM              | Crucial Ballistix Sport LT Red 8GB DDR4 2400       | 3,970          |
| HDD              | Toshiba DT01ACA100                                 | 3,590          |
| Graphics Card    | Intel HD Graphics 630                              | 0              |
| PSU              | Corsair VS450                                      | 2,450          |
| Speakers         | None   | 0              |
| Optical Drive    | None   | 0              |
| Mouse            | AmazonBasics Wired Keyboard and Wired Mouse Bundle | 779            |
| Keyboard         | AmazonBasics Wired Keyboard and Wired Mouse Bundle | 0              |
| <b>Sub-total</b> | <b>(Excluding Monitor)</b>                         | <b>27,623</b>  |
| Monitor          | BenQ G615HDPL 15.6-inch                            | 4,209          |
| Cabinet          | OEM Cabinet  | 1,000          |
| <b>Total</b>     |  | <b>₹32,832</b> |

## MID-RANGE GAMING

|                  |  |                |
|------------------|--|----------------|
| Processor        | Intel Core i5 7th Gen 7400                                     | 15,500         |
| Motherboard      | MSI H270M BAZOOKA  | 9,450          |
| RAM              | Crucial Ballistix Sport LT Red 8GB DDR4 2400 UDIMM             | 3,970          |
| HDD              | Zotac SSD 120GB ZTSSD-A4P-120G + Seagate Barracuda ST1000DM003 | 6,280          |
| Graphics Card    | ASUS GeForce GTX 1060 6GB Turbo                                | 22,600         |
| PSU              | Antec VP550P 550 Watts   | 3,933          |
| Speakers         | Philips MMS-4040F/94 2.1                                       | 2,879          |
| Optical Drive    | Asus DVD-Writer 24X (DRW-24D5MT)                               | 1,120          |
| Mouse            | Dragon War Storm wired Keyboard & 3200 Dpi Led Mouse Combo     | 1,249          |
| Keyboard         | Dragon War Storm wired Keyboard & 3200 Dpi Led Mouse Combo     | 0              |
| <b>Sub-total</b> |  | <b>66,981</b>  |
| Monitor          | Benq GW2470H 24 inch   | 9,400          |
| Cabinet          | Corsair Spec 1 Red CC-9011050-WW                               | 3,300          |
| <b>Total</b>     |  | <b>₹79,681</b> |

## ULTRA HIGH-END GAMING

|               |  |                  |
|---------------|--|------------------|
| CPU + Cooler  | Intel Core i7-7700K + Cooler Master Seidon 120V Plus         | 33,110           |
| Motherboard   | GIGABYTE GA-Z270X-Gaming 5                                   | 21,600           |
| RAM           | Corsair Vengeance (8 x 2) 16GB CMU16GX-4M2A2666C16R 2666 MHz | 8,370            |
| HDD           | WD30EZRZ + Samsung 960 Pro 512GB SSD                         | 37,960           |
| Monitor       | Acer XB270HU 27-inch 144Hz 4K G-Sync                         | 62,665           |
| Graphics Card | Gigabyte GTX 1080 8GB Xtreme Gaming Premium                  | 62,800           |
| Cabinet       | Corsair Graphite 760T  | 14,073           |
| PSU           | Corsair SMPS RM1000  | 12,600           |
| Speakers      | JBL LSR305   | 15,399           |
| Optical Drive | LG Blu-ray WH14NS40 RW                                       | 5,875            |
| Mouse         | Zowie FK2  | 5,310            |
| Keyboard      | Cooler Master Masterkeys Pro L                               | 9,610            |
| Sound Card    | Creative Sound Blaster Audigy PCIe RX 7.1                    | 6,667            |
| <b>Total</b>  |  | <b>₹2,96,039</b> |

## ENTRY-LEVEL GAMING

|                  |  |                |
|------------------|--|----------------|
| Processor        | Intel Core i3 - 7100                               | 9,935          |
| Motherboard      | ASRock H170 Pro4S                                  | 6,899          |
| RAM              | Crucial Ballistix Sport LT Red 8GB DDR4 2400 UDIMM | 3,970          |
| HDD              | Toshiba DT01ACA100                                 | 3,590          |
| Graphics Card    | Sapphire Radeon RX 470 4GB DDR5 OC                 | 15,850         |
| PSU              | Corsair VS450                                      | 2,450          |
| Speakers         | F&D F-203G 2.1                                     | 1,029          |
| Optical Drive    | LG GH24NS95 DVD Writer 24X SATA                    | 990            |
| Mouse            | Gamdias Ares V2 Essential Gaming Combo             | 1,055          |
| Keyboard         | Gamdias Ares V2 Essential Gaming Combo             | 0              |
| <b>Sub-total</b> | <b>(Excluding Monitor and Cabinet)</b>             | <b>45,768</b>  |
| Monitor          | HP 22es IPS 21.5 inch                              | 8,755          |
| Cabinet          | Antec VSK 4000B U3                                 | 2,485          |
| <b>Total</b>     |  | <b>₹57,008</b> |

## BASIC VIDEO EDITING / CAD RIG

|                  |   |                  |
|------------------|---|------------------|
| Processor        | Intel Core i7 6800K   | 33,500           |
| Motherboard      | ASRock X99 TAICHI   | 23,799           |
| RAM              | 2x Avexir AVD4UZ13000I508G-2BZ1RR (8GB x 4)                   | 19,400           |
| HDD              | Seagate Barracuda ST2000DM006 2TB + Adata Premier SP580 240GB | 11,175           |
| Graphics Card    | ZOTAC GTX1070 AMP! Edition                                    | 37,700           |
| PSU              | Corsair SMPS CS750M   | 8,190            |
| Speakers         | F&D F550X 2.1   | 3,849            |
| Scratch Disk     | Toshiba XG3 128GB M.2 2280 NVMe SSD                           | 9,099            |
| Mouse            | Logitech G100s Wired Gaming Combo                             | 1,500            |
| Keyboard         | Logitech G100s Wired Gaming Combo                             | 0                |
| Sound Card       | None  | 0                |
| <b>Sub-total</b> | <b>(Excluding Monitor)</b>                                    | <b>148,212</b>   |
| Monitor          | Dell UltraSharp 2415  | 19,499           |
| Cabinet          | Corsair Graphite Series 230T Window Black                     | 5,850            |
| <b>Total</b>     |   | <b>₹1,73,561</b> |

## PRIMARY DIGIT TEST RIG

|                 |   |                  |
|-----------------|---|------------------|
| Processor       | Intel Core i7 - 6950X (Extreme Edition)         | 131,100          |
| Motherboard     | Gigabyte X-99 SLI                               | 19,950           |
| RAM             | Apacer Panther 2666 MHz 32 GB (4x 8 GB)         | 15,840           |
| HDD             | Western Digital WD40EZRZ                        | 12,444           |
| SSD             | SanDisk Extreme II 480GB (2x 240GB)             | 34,000           |
| PCIe SSD        | Intel 750 NVMe + Kingston HyperX Predator 480GB | 118,199          |
| Graphics Card   | GIGABYTE GeForce GTX 1080 XTREME Gaming         | 62,800           |
| Cabinet+ Cooler | NZXT H440 + Noctua NH-D15                       | 18,086           |
| PSU             | Corsair HX1000i 1000W                           | 16,699           |
| Monitor         | Acer Predator X34                               | 89,000           |
| Optical Drive   | NA  | NA               |
| Mouse           | Razer DeathAdder Elite                          | 4,700            |
| Keyboard        | G.SKILL Ripjaws KM780 RGB                       | 14,770           |
| <b>Total</b>    |   | <b>₹5,37,588</b> |

# digit RECOMMENDED BUYS

From smartphones to gaming laptops, here's what we recommend for your next purchase!



## TOP 3 GAMING MONITORS

| Brand | Model            | Price (in ₹) |
|-------|------------------|--------------|
| ASUS  | ROG Swift PG279Q | 85,679       |
| Acer  | Predator XB281HK | 62,665       |
| BenQ  | XL2411Z          | 25,645       |



## TOP 3 PREMIUM SMARTPHONE

| Brand   | Model               | Price (in ₹) |
|---------|---------------------|--------------|
| Apple   | iPhone 7 Plus 128GB | 77,000       |
| Google  | Pixel 32GB          | 57,000       |
| OnePlus | 3T 64GB             | 29,999       |



## TOP 3 BLUETOOTH EARPHONES

| Brand     | Model    | Price (in ₹) |
|-----------|----------|--------------|
| Jaybird   | X2 Sport | 13,500       |
| Brainwavz | BLU-200  | 3,699        |
| MPOW      | Swift    | 1,599        |



## TOP 3 YOUTUBER MICROPHONES

| Brand | Model    | Price (in ₹) |
|-------|----------|--------------|
| Rode  | NT-USB   | 16,668       |
| Blue  | YETI     | 10,000       |
| Blue  | Snowball | 4,332        |



## TOP 3 GAMING LAPTOPS UNDER ₹1,00,000

| Brand | Model         | Price (in ₹) |
|-------|---------------|--------------|
| ASUS  | Strix GL553V  | 94,990       |
| Dell  | Inspiron 7559 | 89,990       |
| MSI   | GL62M         | 69,990       |



## TOP 3 GAMING MICE UNDER ₹6000

| Brand       | Model             | Price (in ₹) |
|-------------|-------------------|--------------|
| Logitech    | Proteus Core G502 | 5,495        |
| Steelseries | Rival 300         | 4,399        |
| ASUS        | Cerberus          | 1,500        |



## TOP 3 MECHANICAL KEYBOARD UNDER ₹3000

| Brand     | Model | Price (in ₹) |
|-----------|-------|--------------|
| Redgear   | MK881 | 2,995        |
| Zebronics | Max   | 2,390        |
| TVS       | Gold  | 2,158        |



## TOP 3 POINT AND SHOOT CAMERAS

| Brand | Model          | Price (in ₹) |
|-------|----------------|--------------|
| Sony  | RX100 V        | 79,990       |
| Canon | PowerShot G3 X | 59,995       |
| Canon | PowerShot G9 X | 29,500       |



## TOP 3 M.2 NVME SSDs

| Brand    | Model                 | Price (in ₹) |
|----------|-----------------------|--------------|
| Samsung  | 960 Pro 512GB         | 31,275       |
| Samsung  | 950 Pro 512GB         | 28,875       |
| Kingston | HyperX Predator 240GB | 19,000       |



## TOP 3 SMARTPHONES UNDER ₹8000

| Brand  | Model    | Price (in ₹) |
|--------|----------|--------------|
| Xiaomi | Redmi 3s | 6,999        |
| Meizu  | M3s      | 7,999        |
| Lenovo | Vibe K5  | 6,999        |





## Facebook's new filters

The social media giant is planning to include more customisable filters for graphic content and violence. <http://dgit.in/FBfilters>



## Higher PC prices

One of the largest PC manufacturers in the world expects PC prices to likely go higher this year despite lower sales. <http://dgit.in/hikePCs>

**Price Watch**

# SPEND SMART

If you've been planning to invest in a 4K TV or an Ultrabook now's your chance. Our comprehensive list brings you the prices of the most popular models in the market.



## 4K TV

| Brand   | Model           | Display Size | Functionality    | Screen type | HDMI Port | USB Port | Price (₹) |
|---------|-----------------|--------------|------------------|-------------|-----------|----------|-----------|
| Samsung | Series 9 JS9500 | 88-inches    | Samsung Smart TV | LED         | 4         | 3        | 23,99,900 |
| LG      | Signature 77G6T | 77-inches    | webOS 3.0        | OLED        | 4         | 3        | 16,69,990 |
| LG      | 86UH955T        | 86-inches    | webOS 3.0        | LED         | 3         | 3        | 11,99,900 |
| Samsung | Series 9 KS9000 | 65-inches    | Samsung Smart TV | LED         | 4         | 3        | 10,49,900 |
| Samsung | Series 6 KU6570 | 78-inches    | Samsung Smart TV | LED         | 3         | 2        | 7,03,900  |
| Sony    | Bravia Z9D      | 65-inches    | Android TV       | LED         | 4         | 3        | 5,04,900  |
| LG      | OLED65E6T       | 65-inches    | webOS 3.0        | OLED        | 4         | 3        | 5,79,900  |
| Philips | 8600 series     | 65-inches    | HbbTV            | LED         | 4         | 2        | 3,72,500  |
| Sony    | 55X9350D        | 55-inches    | Android TV       | LED         | 4         | 3        | 2,84,900  |
| Sony    | 55X9300D        | 55-inches    | Android TV       | LED         | 4         | 3        | 2,64,900  |
| Samsung | Series 6 KU6000 | 60-inches    | Samsung Smart TV | LED         | 3         | 2        | 2,41,900  |
| LeEco   | Ultra HD        | 65-inches    | Android TV       | LED         | 3         | 2        | 1,35,190  |
| LG      | 49UH850T        | 49-inches    | webOS 3.0        | LED         | 3         | 3        | 1,34,900  |
| VU      | Iconium         | 65-inches    | Smart TV         | LED         | 4         | 3        | 99,990    |
| Philips | PUT7690         | 49-inches    | Smart TV         | LED         | 2         | 2        | 75,500    |



## ULTRABOOKS

| Brand     | Model              | Processor | Screen Size | Resolution | OS              | Memory | Storage    | Graphics      | Price (₹) |
|-----------|--------------------|-----------|-------------|------------|-----------------|--------|------------|---------------|-----------|
| Lenovo    | ThinkPad X1 Carbon | i7-6600U  | 14-inches   | 2560x1440  | Windows 10 Pro  | 16GB   | 512 GB SSD | Intel HD 520  | 1,86,000  |
| Apple     | MacBook Pro        | i7-6500U  | 15.4-inches | 2880x1800  | macOS Sierra    | 16GB   | 256 GB SSD | Intel 530     | 1,85,680  |
| HP        | Spectre x360       | i7-7500U  | 15.6-inches | 3840x2160  | Windows 10 Pro  | 16GB   | 512 GB SSD | Nvidia 940MX  | 1,62,900  |
| Microsoft | Surface Pro 4      | i5-6500U  | 12.3-inches | 2560x1600  | Windows 10 Pro  | 16GB   | 512 GB SSD | Intel Iris    | 1,62,690  |
| HP        | Spectre 13         | i7-7500U  | 13.3-inches | 1920x1080  | Windows 10 Pro  | 8GB    | 512 GB SSD | Intel HD 620  | 1,52,290  |
| ASUS      | Zenbook 3          | i7-7500U  | 12.5-inches | 1920x1080  | Windows 10 Home | 16GB   | 512 GB SSD | Intel HD 620  | 1,47,990  |
| Lenovo    | Yoga 900           | i5-6200U  | 13.3-inches | 3200x1800  | Windows 10 Home | 8GB    | 512 GB SSD | Intel HD 520  | 1,20,426  |
| Dell      | XPS 13             | i5-7200U  | 13.3-inches | 1920x1080  | Windows 10 Home | 8GB    | 256 GB SSD | Intel HD 620  | 1,08,990  |
| Acer      | Swift 7            | i5-7Y54   | 13.3-inches | 1920x12080 | Windows 10 Home | 8GB    | 256 GB SSD | Intel HD 620  | 99,999    |
| ASUS      | Zenbook UX305UA    | i7-6500U  | 13.3-inches | 3200x1800  | Windows 10 Home | 8GB    | 512 GB SSD | Intel 520     | 93,990    |
| HP        | Envy x360          | i7-6500U  | 15.6-inches | 1920x1080  | Windows 10 Home | 8GB    | 1 TB HDD   | Nvidia 930M   | 89,240    |
| Lenovo    | Ideapad 710s       | i5-7200U  | 13.3-inches | 1920x1080  | Windows 10 Home | 8GB    | 256 GB SSD | Intel HD 620  | 73,390    |
| Dell      | Inspiron 14 7000   | i5-7200U  | 14-inches   | 1920x1080  | Windows 10 Home | 8GB    | 1 TB HDD   | Nvidia 940MX  | 69,390    |
| Apple     | MacBook Air        | i5-5200U  | 13.3-inches | 1440x900   | macOS Sierra    | 8GB    | 128 GB SSD | Intel HD 6000 | 60,390    |
| Acer      | Aspire S 13        | i5-6200U  | 13.3-inches | 1920x1080  | Windows 10 Home | 8GB    | 128 GB SSD | Intel HD 520  | 59,990    |

**Unwind**

Memes, Memes everywhere. Here are some memes that we feel should never have existed.

**Community**

This section showcases the achievements and writing contributions from our reader community.



**S**o apps are cool... they do stuff. Yada yada, we all know that. But there are a certain apps – right from the depths of insanity – that defy logic and make you go “*What the heck were they thinking?*”

Disclaimer: Apple has far stricter policies for the app store and a much more stringent screening process, so don't be surprised if you do not find iOS apps here, although some of them may have iOS alternatives

**SEND ME TO HEAVEN**

This one did get its 15 minutes of fame when Apple officially removed it from the App Store in 2013. There is only one purpose this app fulfills – killing your phone. We don't mean to sound over-dramatic but if throwing your new shining smart-phone as high as you can in the air doesn't count as technological homicide, we don't know what does!

The app uses the phone's accelerometers to judge the height to which you have flung it – and it knows when you're cheating. So dropping it from a high enough floor doesn't work because it measures the distance travelled against gravity as well to match it with the fall. Apple had banned it because it violates its design policy – the app encouraged wilful damage of the iOS device, while Android has enforced nothing similar and the app is still available for the adventurous among you. If competing against your friends wasn't enough, you have global leaderboards along with weekly and daily top 10s.

If you do decide to go ahead and try it, keep in

mind that SMTH developer Carrot Pop categorically denies any responsibility for damage caused to your device while using the app. And it is highly unlikely that any manufacturer would support your cause either. So the best

idea would be keep your phone within the confines of gravity and let this ridiculous app be.

**Android** - <http://dgit.in/SMTHapp>



Yeah, as if the app itself promotes something 'right'

**IFART**

We should probably give a disclaimer here that we intend no insult to the digestively challenged. That being said, iFart is actually a well thought out app, especially for those who never get tired of gastric humour. Aiming to be



## Live-streaming birth

A father who live-streamed his son's birth on Facebook loses copyright court case against several media outlets <http://dgit.in/LiveBirth>



## Peloton Technology

This enables two semi trucks to platoon using V2V communications and radar, with one leading and one following. <http://dgit.in/PelotonT>

Feature

your all-in-one digital fart solution, the app kicks off with the set of 32 fart sounds at your disposal – just use the scroller and hit the fart now button to let it e-rip.

There are some interesting features on this app - sneak attack and security fart. Sneak attack lets you set a timer that will play the selected fart sound when the counter hits zero. On the other hand, Security fart lets you enable a 'fart' lock, where any movement detected after five seconds of enabling will create another fart sound. And just in case you're a particular kind of nasty, you can also record fart sounds on this one.



The 'I'm feeling lucky' option is for the special ones out there

to mark where you've 'dropped a bomb', and then share it with your friends on social media or messaging platforms.

Why would you do this? Our best guess is bragging rights of a strange, weird kind. But there are some uncommon use cases. As one user on Play Store puts it, "As a long haul truck driver this is a great app, helps me know which truck stops are clean and which are disgusting!" But if you're wondering where

they got this idea, this apparently has been a thing on Foursquare among some users, where they name certain locations, or more specifically, some restrooms, so that when they check-in to answer nature's call, they can conveniently let their friends know. Once again - why would anybody want to do this? We change our answer - we truly don't know.

Android - <http://dgit.in/PoopApp>



Interestingly, there is also a fart store where you can buy fart packs - Fart Wars themed, Celebrity Farts - whatever suits your ears!

Android - <http://dgit.in/iFartapp>

## PLACES I'VE POOPED

Lets just get the digestive system over with. *Places I've Pooped* is a fairly popular app, and there are disconnected iOS and Android versions from different developers that do pretty much the same thing – document your bowel movement with a location marker. You can only do two things on this app: place a marker on your current location

## YO

This one poses a more difficult question – is the app more ridiculous or the popularity it acquired? To quote from the official description on the Play Store, "You have a list of your friends, you tap them to send them "Yo". Yo. It's that simple." – Yes, exactly.

One of the things that the app boasts about is the ability to quickly reach out to someone – a simple tap on the Yo app, compared to 11 taps on compared messaging platforms. Yo also lets you send locations by double tapping the contact name, links by long

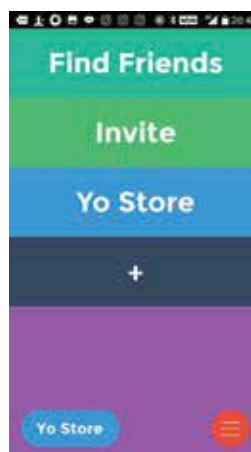


pressing the contact name and even subscribe to popular publications to receive their top content as links. Needless to say, this is inexplicably popular. What confuses us is that why would you use this when there are already established platforms that let you communicate in full detail? Disagree with us? Let us know.

Android - <http://dgit.in/JustYoApp>



Yes! What a glorious conquest, right?



We're kinda glad that we've got no friends on this one

## HUG ME

This one's a fine example of something that would have sounded agreeable on paper when it was proposed, but fell flat when reality happened. For those times when you don't have a near and dear one around you, when you need a friendly hug, *Hug Me* lets you share virtual hugs. To begin with, you set your status as 'Hug me', so that you show up on the lists of those around you (based on the distance filter that they've set). Then, they can send you hug requests. Oh wait, you can do the same – so fulfilling, right? You can also send hugs to random strangers from around the world. Its all about hugs – hugs hugs hugs everywhere, hug him hug her hug this hug that... Sorry, we lost it for a moment there. That's what an overdose of virtual meaning-





## Inputs for Google Pixel 2

Product Lead Krishna Kumar recently made a post urging consumers to provide input for new Pixel 2 design. <http://dgit.in/PixelInput>



## Time-out on Twitter

Twitter's new anti-abuse measure is identifying and engaging abusive behaviors and putting online bullies in 'time-out' <http://dgit.in/Tweetout>

less hugs does to you. Once a hug request is accepted, the two users can go on to chat. Hmm, sounds like the PG version of a certain hugely successful app.

**Android** - <http://dgit.in/HugMeApp>

## HOLD ON

Remember the golden rule that told you never to go full retard? Well you should've told that to the designers of this app! This app essentially has one button and you have one job - to keep your finger on it. Yes - you've literally got one job to do! There's a timer that keeps showing you how long you've been at it. Doesn't this remind you of those childish games we used to play to see how long someone can stand on one leg? But that one required even some semblance of actual skill.

You can also connect your Facebook account to brag about your scores directly on Facebook - although in our case we didn't need to do that and the app directly fired up an in-app Facebook posting widget for the account that was signed in on the Facebook app. Just in case you want to find out who is the most patient (read: jobless) person in your friend circle, starting this off as a challenge might not be such a bad idea.

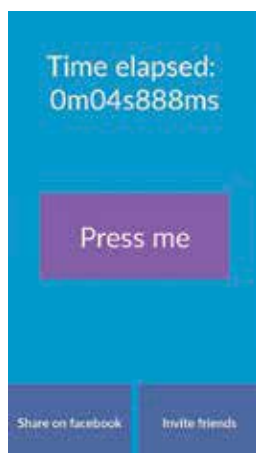
**Android** - <http://dgit.in/HoldOnapp>

## DO NOTHING

It's really tough to explain this app. If there was an app that could truly represent nothingness - an absolute vacuum of functionality, design and anything else that you could expect from an app - this is it. Go ahead, search for this one on the Play Store. No, your eyes are not playing any tricks on you - the app actually doesn't



No hugs for this one



Almost tops our list for 'most useless things you can ever do'

**Android** - <http://dgit.in/DoNothingApp>

## MOST EXPENSIVE APP

Do you have meaningless, ridiculous amounts of cash that you simply want to waste without a reason? Give it to us. No? Well, it was worth a shot! Anyway, there is one other way that you can squander away your money - status symbol apps. Yes, there are not one, but many apps on the Play Store (Apple doesn't really allow apps that don't offer a definite service) that simply have a huge price tag attached to them and usually don't do much more than display

have any logo, cover image or screenshots. Be brave and install it.

Then go to your phone's menu and find the app. Still nothing, right? Remember the time and date (you might want to jot it down somewhere) because this is where you are about to experience true nothingness. Brace yourself and tap on the icon (or the absence of it). There you go - true, sheer, nothingness.

To be honest, we weren't really expecting any use case from this app - we were overwhelmed by the Zen nothingness. But just in case you were wondering, this app is intended to be linked to unwanted short-cuts in your smartphone launcher that would otherwise register unwanted gestures and taps. As Master Yoda once said (or will say now once he uses this app), have a purpose, nothingness does.



a widget, a wallpaper or an icon on your smartphone as a status symbol.

If you're thinking 'Who the hell is going to get this?'. One of them actually has more than 100 installs. If they thought that it was a joke - well, let's just hope that they got their refunds, shall we?

**Android** - <http://dgit.in/MExpApp>

## POCKET FAN SIMULATOR

Summer is almost upon us. Well, maybe not quite, but a lot of us in India are already feeling the heat during our daily commute. There are quite a few ways to deal with that - wear airy clothing, keep water with you at all times, choose the bus over the train (like some of us actually do) or you could just get a Pocket Fan Simulator.

Out of all the simulators that I have heard of, this one takes the cake and throws it right into the fan - literally. On a hot summer day, if you do fire this app up, all you need to do is chose the fan (you've got a few design and colour options - a total of 7), start it and chose the speed. There you go, you can now look at a virtual fan blowing virtual air at you. As an added bonus, you can even unlock special fans by watching ads!!

**Android** - <http://dgit.in/PcktFnSim>



No, we're not 'fanning' the flames of any bad jokes here.



IIT ROORKEE



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For More Details:

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Cognizance Office, Multi Activity Center

IIT Roorkee, Roorkee-247667, Uttarakhand, India



SAMSUNG



## New Driver for Vulkan

Intel releases new drivers for their Iris series GPUs which support the new Vulkan API. <http://dgit.in/irisVulkan>



## Team Fortress 2 bug

A significant bug that had been in TF2 ever since its launch in 2007 has finally been fixed. <http://dgit.in/TF2fix>

# THE STUPIDEST MEMES EVER

IN THE WORLD OF MEMES, THERE ARE STUPID MEMES AND THERE ARE REALLY STUPID MEMES. WE'RE GOING A STEP FURTHER...



### BAE

What's bae you ask? Well, the way a certain user named Trong puts it, it is the "bastardization of the term 'babe'." We agree. The terms bae and SO, in our opinion, should never have taken off. But unfortunately, we aren't that lucky and the Internet is littered with all sorts of SOs and baes now. *\*sigh\**



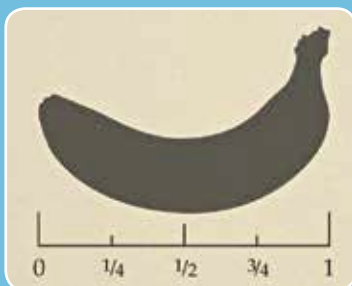
### DUCK FACE

Initially known as the "Myspace face", we all know this about this one. We all hate this one too. A few years ago every single selfie had a duck face in it; Every. Single. Selfie. The ducks were EVERYWHERE. While we don't see it as frequently nowadays, we don't think it's going away anytime soon.



### SALT BAE

Salt bae. Really? *Salt* bae? So the man does things a bit flamboyantly, but c'mon! 48 hours, that's all it took for *#saltbae* to become a thing. It has of course inspired a host of parody images and videos since and still plagues the Internet as we speak. We really need to reevaluate how we turn things into memes...



### BANANA FOR SCALE

An age old scale for measurement when it comes to memes. Banana for scale first originated when somebody selling a TV used a banana for scale because they couldn't find the measuring tape. Well, you can thank whoever had that bright idea because the banana is now the (un)official means for measurement in memes.



### SWAG

How did the definition of swag go from "to move heavily and unsteadily" to someone who "exudes confidence and/or arrogance"? It's completely beyond us. Well, as far as we're concerned, we'll be deferring to the original definition (the former) whenever someone claims they have "swag."



### TRASH DOVE

If you've been on Facebook recently, then you're bound to have come across the Trash Dove. First off, it's not even a dove! This annoying purple pigeon is all over the place, some even going as far as calling it a "symbol" for the alt-right. *Seriously?* There's already a petition to have the damn bird removed from Facebook. **Sign it.**





## EasyDo for Android

EasyDo's simply named "Email" application that gained a lot of popularity for iOS is coming to Android. <http://dgit.in/EasyDoA>

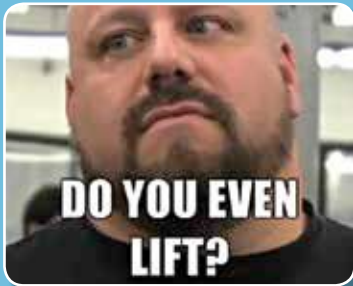


## Samsung bribery case

Seoul Central District Court has issued an arrest warrant for Samsung VC Lee Jae-yong on charges of bribery. <http://dgit.in/SamsungVC>

Unwind

## HOW WE UNWIND



### GEEK FITNESS

If there's one thing geeks know how to do, it's gamifying stuff. Geeks are incidentally very competitive as well. End result is we've been working out (believe it or not) in the labs every now and then, and made a competition out of it to motivate each other. Siddharth has even gone as far as carrying a yoga mat to work.



### ROCK FUSION DISCOVERY

From what we've collectively experienced, fusion experiments don't work too well. Which is why this month's desi-rock discoveries have been quite serendipitous and on continuous loop in the Test Center. Check out *Shiva* by *Thaikkudam Bridge* and *Adheko Ghume* by *Arnob* to get a small taste of what we've been swinging to.



### BETTER LATE THAN NEVER

Arnob finally decided to wipe the dust off his 560Ti, for his "bae" had started playing EVE Online! While it's just a couple rounds of Hearthstone every now and then, we trust him to get there eventually (very doubtful). He has claimed that he will finish the Mass Effect trilogy before Andromeda releases. Pfft, yea right.

## digit DIARY

Wow, is it almost March already? February sure was uneventful... by our standards anyway. So much so that we thought we'd actually managed to close the issue on time this month. Looks like the grilling we took last month actually paid off. Considering the fact that this month has the least number of days as well, we've done quite well. We should all pat each other on our backs if we manage to pull this off.

What else happened this month? Oh right, Valentine's day. We all spent Valentine's with our special someones, or as kids these days say it, our significant others. Arnab took the whole day off (despite saying he would come and leave early), to enjoy with his lady love. Siddharth meanwhile, spent a whole two hours on the phone with his SO, whoops, we mean Robert. Yep that's right he spent two hours on the phone with Robert. Mithun, Abhijit, Manish and Yanger on the other hand, spent the day caressing mice and fingering keyboards, in office. Speaking of which, we don't really know whether Yanger has a special

someone in his life or not. Actually, we don't know a lot about him at all. But we did find out what his favourite football club is. Refer to the quote of the month to figure out which one. Well, it's not much, but it's as good a start as any.

We haven't been playing CS:GO as much these days. Even our streams have taken a back seat, thanks to closing.

But we did get to try a lot of games in beta this month. Ghost Recon: Wildlands earlier in the month and For Honor later on. Other than that, Mithun and Manish have started playing Dota 2 a lot. They both constantly play against each other (with bots of course, they don't have the stones to play PVP). So far Mithun has

won every single time. Manish of course keep blaming the bots, but we all know he just isn't as good as Mithun. Yet. Siddharth on the other hand managed to get all the way to Gold Nova 3 on his own. Then he deranked the moment he played with us. Hmm. Guess he probably just got carried every time.

### The Digit SKOAR! board

|                    |                          |
|--------------------|--------------------------|
| Difficulty level   | : 42 push-ups            |
| Skills learned     | : Alternative Facts      |
| Quote of the month | : "Chelsea is NOT shit!" |

- Yanger



## Killing 30 sec ads

YouTube has announced that by 2018 they will kill their 30 seconds non-skippable ads. <http://dgit.in/UtubeAds>



## Cheap iPhones in India?

Apple may start manufacturing iPhones in India, but it won't mean cheaper iPhones yet. <http://dgit.in/INRiPhone>



Every month we recognise the best article written by our community members and publish it here. Keep up the good work, Digitians!

# INVESTING LIKE A GEEK

TOOLS, TIPS AND TRICKS THAT WILL HELP YOU WORK THE MARKETS LIKE A PRO.



Praneet Sab

Now that you've decided to make your money work for you by investing in the stock market; it's probably a good idea to learn and experiment with more things related to it before you go all-in with your money and possibly, lose a significant portion of it. If you're an 'experienced' investor whose actions are driven by other expert investors, that's probably a red

flag telling you to learn more. Stock market investors are mainly divided into two parts, technical and value investors, and you need to know both of them to maximize returns. After all, knowledge gives you confidence and confidence provides you with the ability to predict the future, and that's what we require the most, the ability to predict future prices – though you can't be entirely accurate, you'll increase your accuracy, which will ultimately increase your portion of the winnings. So get familiar with the resources in this article and increase your odds of winning.

## THE RIGHT PLACE TO LEARN FROM

When I wished to learn about the stock market in late 2015, all the websites recommended a book named "The Intelligent Investor." I bought it of course, but here's the bummer, the book was hard to comprehend. It involved all kinds of abbreviations that made no sense to me. I barely made it through five chapters before giving up – now I realize that that's okay. I just needed the right resources which I eventually figured out:

- **Preston Pysh 'Lessons on Buffet Books'** [<http://bit.ly/2kfZxy5>]: A free three course series available on YouTube that will get you familiar with the 'behind-the-scenes' of the stock market. It was also the first place that actually taught me something.
- **The Intelligent Investor Video Course** [<http://bit.ly/2kdzkig>]: Pair up this course with the book, 'Intelligent Investor,' and you'll end up with an invaluable resource of knowledge. This is not free but is more valuable than spending money on some random trading course.
- **Zerodha Varsity**: No matter how hard you try, you can't avoid this. The two mentioned above will help you with value



investment, and Varsity will assist you with any remaining questions that you may have. Also, it's free.

It would take you approximately a month or two to complete the above three courses, but let me assure you, you will have already learned more than the majority of 'investors' out there. Also, bookmark [www.MorningStar.in](http://www.MorningStar.in) which

is going to be your companion forever. It lists financial details of all the companies out there in a very user-friendly manner (only if you've gone through those courses).

## SIMULATORS

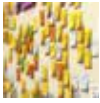
It's always a better idea to experiment with virtual cash before investing real money. Or maybe you could maintain two portfolios, actual and virtual, where you play safe in one and take risks in the other – and then compare which profile suits you more. No matter what your motivation may be, it's always a good idea to have experimental virtual cash. There exist a lot of simulators, and they vary from market-to-market. If you're investing in Indian markets, NSE, or BSE, then I recommend using <http://moneybhai.moneycontrol.com>. If you're willing to trade at the NYSE, then switch to <http://www.investopedia.com/simulator>.

Before every trade, note down why you're making that trade (if you've no answer, just don't make the trade, the exception being intuition) and later, use this to analyse how your trade went

## THE RIGHT BROKER FOR YOU

The broker can make or break things for you, and that's why it's necessary to use the right one. In layman's terms, we can classify brokers into two categories; brokers that help you with investments and also charge you, and the other type of brokers won't assist you and will charge a very nominal fee. However, 'you get what you pay for' isn't true here.

The first category are known as full-service brokers, and they will charge you between anywhere from ₹750 to ₹2000 annually plus approx. 0.25-0.5% of trade amount per trade. If you see yourself as a casual trader, someone who doesn't want to



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Digit Squad

## COMMUNITY CREATIONS



Saumya Malhotra

### About the creator

Saumya Malhotra is a class 12 student who realised the transformative power of enquiry-based education at the Stanford Summer Humanities Institute in 2015. She's passionate about creative writing, and soon plans on writing a book on the role of verse in political revolutions. With a keen interest in the French language, she also indulges in playing the piano or dabbling in poetry. Saumya is always keen to extend her support and invest time into social issues such as the lives of migrants in Gurgaon, food price inflation, malnourishment in the slums of Delhi, and bullying.

### About the creation

Saumya founded [www.Questionz.com](http://www.Questionz.com) as a platform to promote academic exploration internationally. It's a platform for high school students across the world to showcase their research work, writings and projects. In the few months since its inception, Questionz has already published 50+ papers across academic disciplines (from the Sciences to the Humanities) and the writings have come from students from as many as 15 different countries across the world. Its broader mission is to promote the spirit of intellectual inquiry and the systematic research method to attract like-minded students from across the world to contribute their works.

put in research, someone who intends to invest without utilizing the full potential of the market then full-service brokers are for you. ICICIDirect, Sharekhan, and Kotak Securities are some of the leaders in this category. Choosing the best would be hard, it's more about best-fit here. So, do your own research.



The second category is discount brokers, and I use them personally – because it's always better to do your own research than to rely on 'experts.' They are significantly cheaper than full-service brokers, but this

doesn't mean that they lack customer support or features. In fact, they want you to do the research work, which in my opinion is inevitable if you're investing – so why not start right away. They will charge you between anywhere from ₹0 to ₹1000 (one time or annually) plus ₹0 to ₹20 per trade (or 0.01%). Only a handful exist in this category, and personally, I prefer Zerodha. Also, using Zerodha you can automate trades, which is our next topic.

### TRADE AUTOMATION

Imagine your software automatically trading on your behalf, on the basis of rules defined by you. That's something a technical investor would love to have and that's what Zerodha offers. You can program your own scripts, and the software will do its magic. You can even 'backtest' your scripts. Zerodha calls this 'algoZ' and, it is a very easy and to-the-point language.

Learning this language is a piece of cake, visit <http://bit.ly/2kdOhr3> to get your hands on it.

### STOCK SCREENERS

Stock Screeners are like filters, but for stocks. You input your rules, and the stock screener will return back with companies that comply with those rules; thus, eliminating the need to go through thousands of companies.

Google used to offer an excellent stock screen but it's kind of broken for the Indian market these days. Personally, I prefer using Investing's stock screen which you can find at <http://bit.ly/2kDaCXf>.

Now, it's your turn to leverage these tools and build a fortune for yourself. But beware, we've all heard this, "investments are subject to market risk. Please read scheme related documents carefully before investing." Good luck trading! 📈

**Note:** This article was written and contributed by a Digit reader who is part of the Digit Squad. The community section intends to showcase writing talents from readers who wish to contribute to the magazine. None of the above is to be construed as investment advice. The views expressed are of the reader alone and not necessarily endorsed by the publisher.



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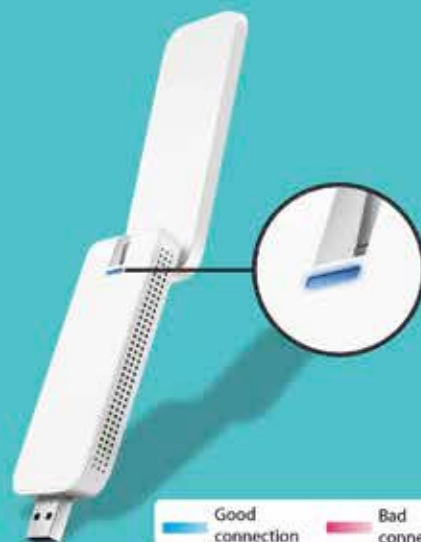
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