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**DEPARTMENT OF COMPUTER TECHNOLOGY AND INFORMATION TECHNOLOGY**

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**INNER WORKINGS OF NEURAL NETWORKS TRAINED ON VISUAL DATA**



Neural networks, which learn to perform computational tasks by analyzing large sets of training data, are responsible for today's best-performing artificial intelligence systems such as speech recognition systems, automatic translators, self-driving cars. But neural nets are black boxes. Once they've been trained, even their designers rarely have any idea what they're doing what data elements they're processing and how. Two years ago, a team of computer-vision researchers from MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL) described a method for peering into the black box of a neural net trained to identify visual scenes.

At this year's Computer Vision and Pattern Recognition conference, CSAIL researchers will present a fully automated version of the same system. Where the previous paper reported the analysis of one type of neural network trained to perform one task, the new paper reports the analysis of four types of neural networks trained to perform more than 20 tasks, including recognizing scenes and objects, colorizing grey images, and solving puzzles. Some of the new networks are so large that analyzing any one of them would have been cost-prohibitive under the old method.

Submitted By  
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**5TH GENERATION MOBILE NETWORKS**



5th generation mobile networks or 5th generation wireless systems, abbreviated **5G**, are the proposed next telecommunications standards beyond the current 4G/IMT-Advanced standards. 5G planning aims at higher capacity than current 4G, allowing a higher density of mobile broadband users, and supporting device-to-device, ultra reliable, and massive machine communications. 5G research and development also aims at lower latency than 4G equipment and lower battery consumption, for better implementation of the Internet of things. The Next Generation Mobile Networks Alliance defines the following requirements that a 5G standard should fulfill:

- Data rates of tens of megabits per second for tens of thousands of users
- Data rates of 100 megabits per second for metropolitan areas
- 1 Gb per second simultaneously to many workers on the same office floor
- Several hundreds of thousands of simultaneous connections for wireless sensors
- Spectral efficiency significantly enhanced compared to 4G
- Coverage improved
- Signalling efficiency enhanced
- Latency reduced significantly compared to LTE.

The Next Generation Mobile Networks Alliance says that 5G should be rolled out by 2020 to Meet business and consumer demands. In addition to providing simply faster speeds, they predict that 5G networks also will need to meet new use cases, such as the Internet of Things (internet connected devices), as well as broadcast-like services and lifeline communication in times of natural disaster..

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### **RANSOMWARE**

This is a type of malicious software that blocks access to the victim's data or threatens to publish or delete it until a ransom is paid. While some simple ransomware may lock the system in a way which is not difficult for a knowledgeable person to reverse, more advanced malware uses a technique called cryptoviral extortion, in which it encrypts the victim's files, making them inaccessible, and demands a ransom payment to decrypt them. It stops you from using your PC. It holds your PC or files for "ransom".

#### **Abilities :**

- Prevent you from accessing Windows.
- Encrypt files so you can't use them.
- Stop certain apps from running (like your web browser).

Ransomware will demand that you pay money (a "ransom") to get access to your PC or files.

We have also seen them make you complete surveys.

#### **Recent Attacks :** Erebus Ransomware:

The ransomware attack affected the websites, database and multimedia files of around 3,400 businesses employing NAYANA's service.

#### **Precaution :**

- Keep the system and server updated.
- Avoid or minimize adding third-party or unknown repositories or packages. Apply the principle of least privilege.
- Proactively monitor and validate your network traffic.
- Back up your files, apply network segmentation and data categorization.

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**FULL SPECTRUM**

Full Spectrum has come up with a way to mitigate the risks of such attacks through the provision of private broadband cellular data networks to utility companies. The attack itself only lasted an hour, but cyber security experts are concerned that the attack was used as proof of concept, rather than a full demonstration of the malware's capability, which suggests that a more complex, serious attack may be in the works. The fiber cuts revealed that much commercial internet traffic was carried over the same fiber points of presence for all providers. Such attacks would have a huge, disastrous impact on a utility company if they were relying on a commercial network.

Full Spectrum's network radios enable wide-area intelligence networks for smart grids, smart pipes, smart fields, and any other mission-critical networks that need internet protocol connectivity. In the United States, there are roughly 3,300 electric utility companies and each of them has to manage its assets securely and reliably. Full Spectrum recently announced that it will begin deploying its own private network service for companies that require secure and reliable networks but are not capable of running the network themselves. The first private network service will launch in the Metropolitan New York Area, followed by one in the San Francisco Bay Area.

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**CYBER SECURITY FEARS DEFERRING IN-FLIGHT WI-FI SERVICES**

The fear of cyber attacks on planes is holding back the Indian government from allowing Wi-Fi on board aircraft. Private players say the security framework sought by authorities is neither impossible nor unusual. India is perhaps the only country other than North Korea, which does not allow in-flight Wi-Fi services. Even international airlines flying over India have to switch off Wi-Fi when they travel over India. Before airlines in India can be permitted to provide Wi-Fi, the pre-requisite laid down by the government is for intercept capability to which Indian authorities have end-to-end audit and control.

From their perspective this is not very different from what we see at many jurisdictions where cyber security or use of information technology for malicious purpose is an area of concern. The Indian government has demanded a framework at par with international standards. In order to get a firsthand experience of how Wi-Fi is enabled on a plane, PTI recently travelled onboard Honeywell's Connected Aircraft, which was in New Delhi last week as part of its world tour. Since May this year it has travelled to Dallas, Mexico City, Panama City, Toronto, New York, London and Paris.

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### **NEW 3D CHIP USING NANO TUBES**



Scientists, including those of Indian origin, have built a new 3D chip using carbon nanotubes that can store and process massive amounts of data, paving the way for smaller, faster and more energy-efficient devices. Computers today comprise different chips cobbled together. There is a chip for computing and a separate chip for data storage, and the connection between the two are limited.

The new prototype chip, developed by researchers at Stanford University and Massachusetts Institute of Technology (MIT) in the US, is a radical change from today's chips. It uses multiple nanotechnologies, together with a new computer architecture, to reverse both of these trends. Instead of relying on silicon-based devices, the chip uses carbon nanotubes, which are sheets of 2D graphene formed into nanocylinders, and resistive random-access memory (RRAM) cells, a type of non-volatile memory that operates by changing the resistance of a solid dielectric material. The researchers, from Stanford, integrated over one million RRAM cells and two million carbon nanotube field-effect transistors, making the most complex nanoelectronic system ever made with emerging nanotechnologies.

Submitted By  
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**EXPLORING OPPORTUNITIES IN IOT SPACE**

Bajaj Electricals sees immense opportunity in the connected devices space and is moving ahead to tap the potential of IoT (Internet of Things) based products. The consumers are not only ready but eager to evolve into this new world of possibilities, the company said in its annual report. Embarked on a new journey in digitisation with our Integrated Building Management System (IBMS) and our lighting solutions which help customers upgrade to next level of lighting.

The company, which is participating in the government project to develop 100 smart cities has already tied up with networking major Cisco and Gooee for it. In its endeavour for creating smart City solutions, Bajaj Luminaires has tied up with Cisco for smart outdoor lighting solutions and UK's Gooee for IoT enabled lighting systems. The Luminaries division of the company would exploit the opportunities and the smart city projects will offer more room for growth.

IoT is the inter-networking of physical devices, which are also referred to as connected devices and smart devices with electronics, software, sensors, actuators, and network connectivity which enable these objects to collect and exchange data. The company aims to roll out new products catering to mass as well as the premium market, which had a gross revenue of Rs 4,334 crore in FY 2016-17.

Submitted By  
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**INDIAN IT COMPANIES EXPECTED TO REPORT MUTED PERFORMANCE  
FOR Q1: ANALYSTS**

Top IT firms in the country are expected to report muted financial performance for the April-June quarter, with margins coming under pressure on account of rupee appreciation and wage revision, according to analysts. Indian tech majors will announce their financial results this week, starting with Tata Consultancy Services. Its smaller peers, Infosys and Wipro are scheduled to announce their numbers, respectively. The IT firms are also under pressure to hire local workers instead of taking Indian employees on work visas to client sites as the US hardens its stance on outsourcing. Higher on-site hiring means higher costs. Infosys has said it will hire 10,000 people in the US over the next two years. Its peers, TCS and Wipro are also taking similar steps.

IT companies have been one of the largest recruiters in the country. Apart from the impact of stringent visa regime, increasing automation of processes would also lead to reduction in hiring in coming years. Industry watchers believe that the pace of growth for these companies will be weaker than usual due to lack of acceleration in the financial services space, which is a major contributor to the sector's revenues. Besides, the pace of new deal closures also seems to be muted. Indian IT sector is facing challenges in the business environment and stricter work permit regime in countries like the US, Singapore, Australia and New Zealand.

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**DIGITAL DEVICES CAN INCREASE RISK OF DRY EYE SYNDROME IN CHILDREN**



Increase in dry eye symptoms among younger patients due to excessive use of digital devices, a study has said. Dr Amber Gaume Giannoni, a local optometry specialist with the College of Optometry at the University of Houston, said the more children stare at a screen, the less they tend to blink, which results in dry eye symptoms, because blinking helps stimulate the glands used to moisturise the eyes. The study also showed that children as young as eight can spend six hours a day in front of a screen.

Giannoni suggested parents set limits to their children's screen time and pay attention to such symptoms as forcefully blinking, eye rubbing and eye redness. She recommended a method of 20-20-20 to decrease digital eye strain a 20-second break for every 20 minutes of staring at a digital device, and looking 20 feet (about six metres) away or somewhere off into the distance.

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**ADDICTION TO GADGETS PROVING TO BE HARMFUL FOR EVEN TODDLERS**

The harried working mother thought she had learnt the trick and the quick parenting. Three years down the line, the distraction has become now a five-year-old who has graduated from watching fairy tales to downloading games and music. There is an increasing trend for parents to resort to the use of a screen as a go-to distraction. Be it when trying to make the child eat, or keeping the child engaged when in public, it seems like a most convenient option to put a phone or tablet in the child's hands.

The instant gratification of using a smartphone and the internet has more side effects than advantages. Parents must avoid handing their phones over to kids to keep them busy. Instead they must encourage the child to participate in some life-skill enhancing activities. While there is no one to prevent such addiction, Parikh warned parents against being punitive, nagging or over- monitoring. It's time to go back to controlling those gadgets, to stop the distraction from becoming an obsession.

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**FACEBOOK TESTING ITS OWN GROUP VIDEO CHAT APP**

Facebook has been working on cloning Snapchat's features for awhile now, but that's not the only service the social media giant is looking to duplicate. The Verge reports that Facebook recently showed a House party-style live group video chat app, called Bonfire, to its employees. Houseparty is incredibly popular with teenagers, and Facebook wanted to find out. Earlier this year, Facebook sent out a survey asking teens for their thoughts on why they enjoy using group video chat apps such as Houseparty and Fam. At the time, Facebook declined to comment to Recode about why they were interested in this information, but now it seems clear. This isn't the first time that Facebook has tried to clone an app from the company Life on Air.

The popular Facebook Live feature contributed to the decline of Life on Air's previous app, Meerkat. Houseparty was built after founder Ben Rubin noted that regardless of platform, most users only broadcasted a few times using live streaming video. While Houseparty is also focused on live video, it notifies teens when their friends are using the app, allowing them to easily enter and exit online video parties. Facebook has been targeting younger users for a long time it's basically copied everything that Snapchat does into its main Facebook app. Only time will tell whether Bonfire will attract more younger users to the social network.

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**MAGIC BENCH**

A new "Magic Bench" designed by Disney Research lets you interact with endearing animated characters and no special glasses or headsets are required. Instead, the complete environment the seat, the sitter and the cartoon humanoid animals is mirrored on a screen opposite the bench, making it possible for others to watch the scene unfold. A camera and sensor capture images and gather depth information about physical objects the bench and the person that algorithms integrate with the 3D animations, the researchers wrote in a study. Meanwhile, haptic sensors built into the bench deliver vibrations that are synchronized to animated actions on the screen, creating the illusion that the animated figures are occupying real-world space next to the user.

Augmented-reality overlays animated elements into views of the real world, typically by using special optical devices or mobile technology. However, one of its limitations is that its illusion can be glimpsed by only a single user. The Magic Bench allows groups of people to gather in a single environment and collectively participate in an augmented-reality experience, all at the same time, according to the study authors. Sitting on the bench triggers the augmented-reality experience, introducing a character into the scene. In a video demonstration, a small cartoon donkey trots into view and kicks the bench, generating a sharp sound and making the seated person jump in surprise. Another test shows two people on the bench, reacting as they "feel" an animated rabbit leap up beside them and jump up and down. When a user passes his hand over the rabbit, a shadow moves across its head as though it were occupying the same physical space as the person next to it. The Disney engineers discovered that if the reconstructed 3D scenes were viewed at an angle, missing data and a small difference in alignment between the camera and sensor created gaps in the image known as "depth shadows".

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**KONGU ARTS AND SCIENCE COLLEGE (AUTONOMOUS), ERODE**  
**DEPARTMENT OF COMPUTER TECHNOLOGY AND INFORMATION TECHNOLOGY**

**ATOMIC FINGER PRINTING**

In the sophisticated world of counterfeiting, it can often be difficult to tell fakes from the real deal. But now scientists have developed a new method that can stamp things with atomic fingerprints to keep phony products at bay. A relatively simple technique for confirming the authenticity of an object an advance that could put a dent in the counterfeit industry, where fakes, forgeries and imitations cost the global economy half a trillion dollars in lost revenue each year.

The new anti-counterfeiting method, has two components: a unique molecular pattern that can be incorporated into a holographic label and a smartphone app. The unique pattern is created by intentionally fabricating flaws into an atom-thin layer of material, such as graphene oxide. Flaws may include removing a carbon atom, or adding extra oxygen atoms, or creating a ridge of atoms. Once the flaw is set, the material is incorporated into an ink and then, using an inkjet printer, printed onto a hologram, which can be added as a label to any product.

To confirm the presence of the atomic pattern, a person would use a smartphone camera and its built-in flash to photograph the label. The flash excites the atoms, which produce a unique color based on the pattern.

Submitted By  
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**HYBRID DRIVING-FLYING ROBOTS**

Whether they're swooping in to deliver packages or spotting victims in disaster zones, swarms of flying robots could have a range of important applications in the future. The robots can transition from driving to flying without colliding with each other and could offer benefits beyond the traditional flying-car concepts of sci-fi lore. The ability to both fly and walk is common in nature. For instance, many birds, insects and other animals can do both. Robots with similar versatility could fly over impediments on the ground or drive under overhead obstacles. But currently, robots that are good at mode of transportation. The researchers previously developed a robot named the "flying monkey" that could run and fly, as well as grasp items. However, the researchers had to program the paths the flying monkey would take in other words, it could not find safe routes by itself.

Now, these scientists have developed flying cars that can both fly and drive through a simulated city-like setting that has parking spots, landing pads and no-fly zones. Moreover, these drones can move autonomously without colliding with each other. The researchers took eight four-rotor "quadcopter" drones and put two small motors with wheels on the bottom of each drone, to make them capable of driving. In simulations, the robots could fly for about 295 feet (90 meters) or drive for 826 feet (252 meters) before their batteries ran out. The roboticists developed algorithms that ensured the robots did not collide with one another. In tests in a miniature town made using everyday materials such as pieces of fabric for roads and cardboard boxes for buildings, all drones successfully navigated from a starting point to an ending point on collision-free paths.

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**WINDOWS DOUBLE AS SOLAR PANELS**

A tech startup on a mission to make modern commercial and housing estates energy neutral has outfitted the headquarters of a Dutch bank with the world's first commercial, fully transparent solar-power-generating windows. The windows have solar cells installed in the edges at a specific angle that allows the incoming solar light to be efficiently transformed into electricity.

Large commercial estates consume a lot of energy. If you want to make these buildings energy neutral, you never have enough roof surface. Therefore, activating the buildings' facades will significantly contribute to making the buildings energy neutral. The windows could generate 8 to 10 watts of power. This enables the user to charge a phone per every square meter two times a day.

Every new type of glass needs power either for the glass to be tinted electrically or heated or inside windows there are these solar blinds, which are electrical and can go up and down but also more and more you can see video glass. The cost of the wiring that brings power from the grid to such windows is considerable in large commercial estates, and investing in power-generating windows would therefore make commercial sense.

The surface of the second generation of PowerWindows will be coated with a special material that transforms oncoming visible light into near-infrared light, which is then transported toward the solar cells in the edges of the windows. The difference is that the glow star emits the green wavelength, but the coating on our windows emits light in near-infrared wavelength. The coating is based on the rare-earth metal thulium.

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**TINY AND LENS-FREE CAMERA**

A tiny, paper-thin camera that has no lens could turn conventional photography on its head. The device, a square that measures just 0.04 inches by 0.05 inches (1 by 1.2 millimeters), has the potential to switch its "aperture" among wide angle, fish eye and zoom instantaneously. And because the device is so thin, just a few microns thick, it could be embedded anywhere. (For comparison, the average width of a human hair is about 100 microns.) The entire backside of your phone could be a camera.

It could be embedded in a watch or in a pair of eyeglasses or in fabric. It could even be designed to launch into space as a small package and then unfurl into very large, thin sheets that image the universe at resolutions never before possible. There's no fundamental limit on how much you could increase the resolution. You could do gigapixels if you wanted. (A gigapixel image has 1 billion pixels, or 1,000 times more than an image from a 1-megapixel digital camera.).

The proof-of-concept device is a flat sheet with an array of 64 light receivers that can be thought of as tiny antennas tuned to receive light waves. Each receiver in the array is individually controlled by a computer program. In fractions of a second, the light receivers can be manipulated to create an image of an object on the far right side of the view or on the far left or anywhere in between. And this can be done without pointing the device at the objects, which would be necessary with a camera."The beauty of this thing is that we create images without any mechanical movement. The synthetic aperture collected light waves, and then other components on the chip converted the light waves to electrical signals that were sent to a sensor. The resulting image looks like a checkerboard with illuminated squares.

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**‘MOTH EYE’ SMARTPHONE COATING DOESN'T REFLECT SUNLIGHT**

Unusual structures on moth eyes that help the insects see at night have inspired a new anti-reflection film for electronic devices. The new technology could help users see their screens even in bright daylight. The film significantly reduces glare as well as the need to duck into the shade to read what's on the screen. For most commercial smart phones, the moth-eye film can improve the readability of the screen by 10 times under a clear sky. Under direct sunlight, the readability can be improved by five times. The nature-inspired film is expected to be inexpensive to manufacture, he said, and has the added benefits of being scratch-resistant and self-cleaning. Users could finally rid their phones of the dust, fingerprints and grime that tend to collect on regular touch screens.

The nanostructures allow light to pass into the eyes, but don't allow it to reflect out. This helps moths see in the dark but also prevents their eyes from reflecting light that might give the insects away to predators. Other scientists inspired by this adaption in moths made solar cells with nanostructured surfaces to reduce the amount of sunlight that reflected away from the panels. Many smartphones and laptops have been designed to solve the problem of glare using a sensor that detects the quality of light and can enhance the brightness or even dim the screen according to the environment. But increasing the display brightness typically drains a device's battery. The moth-eye-like nanostructure film can be fabricated and sold as an accessory for our devices. To make the film, the researchers first created a mold using tiny "nanospheres" that they applied to a glass surface and that self-assembled into a tightly packed layer.

Submitted By  
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**SMART EXOSKELETON**

Assisted walking just got smarter. A new algorithm for an exoskeleton uses direct feedback from the wearer to customize the assistance provided. The exoskeleton is worn on the shin and foot and applies forces to the ankle and toes. In experiments with 11 able-bodied people, the so-called human-in-the-loop algorithm took about an hour to optimize the exoskeleton, and afterward, reduced the amount of energy participants needed to walk by 24 percent. A lightened load is certainly appealing, but a personalized exoskeleton could also increase the distance an able-bodied person can walk, and it could even help individuals run faster. People with physical impairments, such as those who have suffered a stroke, a neurological injury or an amputation, may realize benefits as well. A personalized exoskeleton could make walking as easy or easier than it was before an amputation or injury.

The challenge with exoskeletons is that although they're meant to assist a person, they can impede motion, said Jackson. For starters, each device comes with its own weight, ranging from a few ounces to a couple of pounds, and the user has to carry that weight. Exoskeletons are also designed to apply force to certain parts of the body, but if the timing of the force is off, the person may need to use more energy to move.

During the optimization phase of the recent study, each participant wore an ankle exoskeleton as well as a mask designed to measure levels of oxygen and carbon dioxide (CO<sub>2</sub>). These measures relate to how much energy the person is expending. As each person walked on a treadmill at a steady pace, the exoskeleton applied a set of different patterns of assistance to the ankles and toes.

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**STRETCHY ARTIFICIAL 'SKIN'**

Rubber electronics and sensors that operate normally even when stretched to up to 50 percent of their length could work as artificial skin on robots. It's a piece of rubber, but it has the function of a circuit and sensors. The rubber electronics and sensors have a wide range of applications, from biomedical implants to wearable electronics to digitized clothing to smart surgical gloves. Because the rubbery semiconductor starts in a liquid form, it could be poured into molds and scaled up to large sizes or even used like a kind of rubber-based ink and 3D printed into a variety of different objects.

The electronic skin to accurately sense the temperature of hot and cold water in a cup and also translate computer signals sent to the robotic hand into finger gestures representing the alphabet from American Sign Language. Electronics and robots are typically limited by the stiff and rigid semiconductor materials that make up their computer circuits. As such, most electronic devices lack the ability to stretch.

The stretchable material by mixing tiny, semiconducting nanofibrils nanowires 1,000 times thinner than a human hair into a solution of a widely used, silicon-based organic polymer, called polydimethylsiloxane, or PDMS for short. When dried at 140 degrees Fahrenheit (60 degrees Celsius), the solution hardened into a stretchable material embedded with millions of tiny nanowires that carry electric current. The electronic performance and stretchiness of the electronic material beyond the 50 percent mark.

Submitted By  
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**'See' AROUND CORNERS WITH SMARTPHONE TECH**

In spy novels and superhero films, the ability to see through walls has always been a handy not to mention, impressive trick. And now, this tech could be available to people in real life, with smartphone cameras that can help detect moving objects even if they are hidden around corners. This futuristic-sounding tech could one day help vehicles see around blind corners.

We may eventually be able to use this idea to alert drivers to pedestrians or cars that are about to dart out from behind buildings into a driver's path. Perhaps a few seconds of notice could save lives. Researchers have taken many different approaches in trying to make the "superpower" of seeing around corners a reality. Those surfaces could act like mirrors, scattering the laser pulses onto any hidden objects. By analyzing the light that was reflected off the objects and other surfaces back onto the scanners, researchers could reconstruct the shapes of the hidden items.

Although most strategies for seeing around corners are really great ideas, they also usually require complex modeling [or] specialized hardware, or are computationally expensive. We use light naturally in the scene and do not have to introduce our own light to probe the hidden scene. This allows us to use common consumer cameras and not specialized equipment to see around corners. The new system, known as CornerCameras, analyzes light that is reflected off objects hidden around corners and that falls on the ground within the line of sight of the camera. This light is called the "penumbra."

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**ROBOT CRACKS THOSE CURVY CAPTCHAS IN MINUTES**

An artificially intelligent machine cracked those jumbled text sequences are called as captchas that are used to distinguish human web users from spam-spreading robots. The AI startup, built the captcha-cracking bot says its approach could point the way to more general, human-like artificial intelligence. (Captcha is short for "completely automated public Turing test to tell humans and computers apart.")

These are the things you need to consider if you want to go in the direction of general artificial intelligence referring to the ability of a machine to generalize and learn from very little data. Text-based captchas work because unlike humans, computers struggle to recognize the distorted and partially hidden characters that make them up. Though machine-learning systems that can solve them exist, they must be trained on millions of images to work, George said.

The smart machine built by Vicarious, on the other hand, can be trained in a matter of minutes using just a few hundred example characters, the researchers said. It works with multiple different styles of captcha and can also be repurposed to identify handwritten digits, recognize text in photos of real-world scenarios and detect non-text objects in images.

The company tested the system on text-based captchas from leading providers reCAPTCHA and Bot Detect and those used by Yahoo and PayPal at accuracies ranging from about 57 percent to nearly 67 percent. That's much higher than the 1 percent considered to make them ineffective at stopping bots. Optimizing the system for a specific style can push accuracy up to 90 percent.

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**'ROBUTT' SIMULATES 10 YEARS OF BUTTS ON CAR SEATS**

Robutt is an industrial robot outfitted with padding in roughly the shape of a large man. The robot is being used to test out the new Ford Fiesta in the Ford's European headquarters in Germany. Before the carmaker set Robutt to work, Ford had people enter and exit a car that had been outfitted with pressure sensors on the driver's seat.

As the people sat down and stood up, the sensors recorded how much weight their butts put on the seat and how it was distributed over time. The engineers then used that information to create an average sitting and standing pattern, which Ford calls a "perch pattern," to show how a typical person might use their car's seat.

A typical person would enter and exit their car about 25,000 times over 10 years. So that's exactly what the engineers have Robutt do. The robot works tirelessly, simulating a typical person's perch pattern by pushing against a car seat every day for three weeks. We used pneumatic cylinders that simply moved up and down Ford durability engineer with the Robutt.

The average age of a car rose to 11.5 years, and about a quarter of all cars still in use were bought before the turn of the century. As people hold onto their cars for longer than ever, Robutt's representative rear end will ensure drivers and passengers continue riding in comfort.

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**BRIDGE DEVELOPER KIT**

Logitech is announcing its Bridge Developer Kit, and is making an attractive call on app makers and software developers to help transform the project into reality our reality. A Logitech video was posted recently announcing the SDK for HTC Vive and Vive Tracker. The walk-through explained what Logitech aims to do along with information on the Bridge SDK.

Many people are expressing the desire to have an effective typing-experience in VR," he said, and this is what Logitech is trying to address. After all, there are situations where the user still needs a keyboard to interact with applications, he said in a guest blog, from productivity-driven or desktop scenarios, to games, social applications and content browsing.

When you link the HTC Vibe tracker to the keyboard with the software, it gives you a 3-D model of the keyboard in the virtual environment. You can see your hands and how they interact with the keyboard. One key advantage in this keyboard in VR appears that you can see your keyboard, your hand and type without having to remove your headset. Specifically, they found a way for the HTC Vive Tracker to represent a keyboard across the Steam VR system. The software presents an overlaid virtual representation of the keyboard in a VR application, with animations when keys are pressed.

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## **TECH GIANTS ARE INVESTING MILLIONS IN AI THAT CAN PLAY VIDEO GAMES**

Artificial intelligence researchers at Elon Musk's OpenAI project recently made a big advance by winning a video game. Unlike recent AI victories over top human players in the games of Go and poker, this AI breakthrough involved a game that many people haven't heard of, Dota 2. But to the hundreds of millions of fans of this type of online multiplayer battle game, a computer that can beat a professional player is a big deal.

It's also significant to AI researchers, especially those in companies such as Google, Facebook, Microsoft and IBM, which are investing millions of dollars in creating superhuman AI players for digital games. As AI becomes ever more important in our society, it could have wider implications for all of us because of what it demonstrates about computers' ability to "think" strategically.

The AI learns to differentiate good move decisions (that lead to victory) from bad ones. The knowledge is stored in a huge data matrix containing millions of numbers, updated after every self-play game. These numbers encode what's known as a "function", the instructions that specify the AI's learned strategy for every possible game situation. So after the AI researchers programmed the method for learning, the machine effectively taught itself how to make good move decisions.

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**IT BULLETIN** **Date : 05.08.2017**

## **RESEARCHERS UNVEIL TOOL TO DEBUG 'BLACK BOX' DEEP LEARNING ALGORITHMS**

Debugging the neural networks in self-driving cars is an especially slow and tedious process, with no way of measuring how thoroughly logic within the network has been checked for errors. Manually-generated test images can be randomly fed into the network until one triggers a wrong decision, telling the car to veer into the guardrail, for example, instead of away. A faster technique, called adversarial testing, automatically generates test images it alters incrementally until one image tricks the system.

DeepXplore is able to find a wider variety of bugs than random or adversarial testing by using the network itself to generate test images likely to cause neuron clusters to make conflicting decisions. To simulate real-world conditions, photos are lightened and darkened, and made to mimic the effect of dust on a camera lens, or a person or object blocking the camera's view.

Using optimization techniques, researchers have designed DeepXplore to trigger as many conflicting decisions with its test images as it can while maximizing the number of neurons activated. DeepXplore has application beyond self-driving cars. It can find malware disguised as benign code in anti-virus software, and uncover discriminatory assumptions baked into predictive policing and criminal sentencing software.

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**IT BULLETIN** **Date : 07.08.2017**

## **COMPANIES TURN BLIND EYE TO OPEN SOURCE SECURITY RISKS**

Many software developers and enterprise users have been lax or oblivious to the need to properly manage open source software. Companies are not mindful of open source components and fail to monitor security implications, according to the report, which highlights the consequences of failure to establish open source acquisition and usage policies, and to follow best practices. More than half of the software products currently in use contain open source components, based on the survey's findings. The report reveals hidden software supply chain risks that all software suppliers and IoT manufacturers should know about.

- Only 37 percent of respondents had an open source acquisition or usage policy.
- Sixty-three percent said either that their companies did not have an open source acquisition or usage policy, or they did not know if one existed.
- Thirty-nine percent of respondents said that either no one within their company was responsible for open source compliance, or they did not know who was.
- Thirty-three percent of respondents said their companies contributed to open source projects.
- Of the 63 percent who said their companies did not have an open source acquisition or usage policy, 43 percent said they contributed to open source projects.

However, most software engineers do not track open source use, and most software executives do not realize there is a gap and a security compliance risk.

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**IT BULLETIN** **Date : 08.08.2017**

## **SONY'S AIBO RESURRECTED FROM ROBOT PET CEMETERY**

The autonomous entertainment robot brings fun and joy to the entire family. Among other things, it can bond emotionally with people and give them love and affection. Aibo also lets them experience the joy of nurturing and raising a companion. Aibo has ultra-impact 1- and 2-axis actuators that let it move smoothly and naturally along 22 axes.

Aibo also shows "emotions" through tail and ear movements. Aibo's nice in the sense that you remove all the burdens of ownership and gain the benefits. Aibo has an awareness of its environment, thanks to sensors that can detect and analyze sounds and images, and deep learning technology.

Its eyes are fisheye cameras that use simultaneous location and mapping (SLAM) technology. It also has a front camera. Aibo has a speaker and four microphones. It can detect words of praise and smiles. Capacitive touch sensors in the head, jaw and back enable it to respond to petting and scratching, too.

Aibo can collect data from interactions with owners and collate it with data on the cloud about interactions between other Aibo devices and their owners to enhance its repository. Aibo's data periodically will be backed up in the cloud. The goal is to make it available to load onto a new Aibo in the future. Aibo communicates over LTE or 802.11b/g/n WiFi. It comes with charging pins and a SIM card slot. The battery lasts about two hours, and recharging takes three hours.

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**IT BULLETIN** **Date : 09.08.2017**

## **IT CONVERGENCE TREND ALTERS APPROACH TO FEDERAL MARKET**

Federal agencies have begun using an emerging information technology tool to manage the huge amount of data the United States government generates and stores. Federal IT managers recently have embraced the concept of convergence, which has been gaining traction in the private sector. Agencies also have indicated that the approach may be useful for other federal IT applications.

Converged systems have moved into the top echelon of these innovative options. Just over 70 percent of federal IT managers surveyed believed converged infrastructures would become the central housing mechanism for data center needs. Converged infrastructure is the next step and gives agencies a way to meet the requirements of multiple mandates while saving money and modernizing federal IT systems.

Seventy-three percent of survey respondents said that workloads had increased over the last three years. Data volume increased substantially during that time frame. Almost 75 percent of respondents reported that user volume also had grown. Almost 60 percent of federal IT managers said their agencies were struggling to keep up with such workloads.

. Adoption has conformed with the federal Data Center Optimization Initiative issued just a year ago, with 60 percent of respondents reporting that convergence solutions were being used to replace working data centers.

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**IT BULLETIN** **Date : 10.08.2017**

**NEURAL NETS GIVE LOW-END PHONE PICS DSLR LOOK**

Researchers have found a way to use neural networks to create DSLR-quality photos from snapshots taken with low-end smartphones. A team of scientists at the ETH Zurich Computer Vision Lab recently published a paper describing a deep learning approach that uses neural networks to translate photos taken by cameras with limited capabilities into DSLR-quality photos automatically.

It uses two neural networks that try to fool each other. One network generates images and tries to fool the other network that they're real. At the end, you get a set of images where you can't tell the difference between the real image and the artificially generated image.

In their experiments, the researchers used two data sets one made up of images from a phone camera, the other composed of high-quality photos. Then they used several neural networks to bring the quality of the phone photos up to that of the high-quality images captured with a DSLR. The researchers tried to determine what makes an image good and apply those things to an unknown image to make it better. It doesn't always work, but it's a good example of how software can make suggestions to enhance a photo, and it can only get better.

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**IT BULLETIN** **Date : 11.08.2017**

**GOOGLE CONNECTS MOBILE SEARCHERS TO DEPRESSION**  
**ASSESSMENT TOOL**



The National Alliance on Mental Illness announced that Google on mobile now provides people who search for the term "clinical depression" with a direct link to the PHQ-9 questionnaire used by medical professionals in the United States to evaluate patients for the disorder. People can conduct a self-assessment by filling in the questionnaire online.

When someone conducts a Google search on mobile for information on clinical depression, a link to check if you're clinically depressed will appear in the depression knowledge panel. Clicking on the link will take the user to the PHQ-9 questionnaire. NAMI hopes teaming up with Google will help raise awareness of clinical depression and lead sufferers to determine their level of depression and the need to seek help.

Clinical depression is a treatable condition, and the PHQ-9 can be the first step to getting a proper diagnosis. Because Google stores user data, there may be legitimate concerns that information entered into the PHQ-9 form would be retained. The privacy and security of our users is of the utmost importance. We recognize that this information is sensitive and private, and Google will not store your responses or your results.

Its Verily Life Sciences division, formerly Google Life Sciences, launched Project Baseline, which seeks to collect phenotypic health data from about 10,000 participants over four years. The project will make de-identified data from the study available to qualified researchers for exploratory analysis.

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**IT BULLETIN** **Date : 17.08.2017**

### **WPA2 FLAW COULD BLOW WIFI SYSTEMS WIDE OPEN**

A security flaw in WPA2, the security protocol for most modern WiFi systems, could allow an attacker to steal sensitive data including emails, credit card numbers and passwords.

Depending on the network configuration, the flaw also could allow an attacker to inject or manipulate information in the system.

A series of vulnerabilities were found in Android, Linux, Apple, Windows, OpenBSD, MediaTek, Linksys and other systems. In order to fix the problem, users need to update affected products as soon as patches become available. Microsoft released security updates a week ago, and customers who have Windows Update enabled or otherwise have applied the updates are protected.

The main attack is against the four-way handshake of the WPA2 protocol. The handshake takes place when a user wants to join a protected WiFi network and the protocol is used to confirm that the client and access point has the correct credentials. The attacker manipulates and replays the cryptographic handshake message. When the victim reinstalls the key, the incremental transmit packet number and the receive packet number are reset to their initial values.

The easy answer is the attacker gets the access point to rebroadcast part of the initial handshake, analyzes that information, and then the attacker can intercept the rest of the conversation. During the handshake, the device and access point set up and agree on an initial encryption key.

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**IT BULLETIN** **Date : 19.08.2017**

### **AWS, MICROSOFT OFFER NEW OPEN SOURCE AI FRAMEWORK**

Amazon Web Services and Microsoft announced the availability of Gluon, an open source deep learning library for building artificial intelligence neural networks.



Gluon will make it easier for researchers to define machine learning models using a collection of prebuilt, optimized neural network components. The interface will enable software developers and enterprise users to manipulate machine learning models like any other data structures. Gluon also will enable data scientists and researchers to build prototypes quickly and utilize dynamic neural network graphs for entirely new model architectures without sacrificing training speed.

The Gluon interface allows developers of all skill levels to prototype, build, train and deploy sophisticated machine learning models for the cloud, devices at the edge, and mobile apps. The Gluon interface currently works with Apache MXNet and will support Microsoft Cognitive Toolkit in an upcoming release. In providing the tool as open source, AWS and Microsoft published Gluon's reference specification to better integrate other deep learning engines with the interface. Gluon brings together two key components: training algorithms and neural network models. It eases the effort of integrating AI with applications. As AI tools become easier to use, more developers will create more apps infused with AI, which means AI will have a bigger impact on society.

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**IT BULLETIN** **Date : 23.08.2017**

**RED HAT, SAP TEAM ON NEW INTEGRATED ENTERPRISE LINUX  
PLATFORM**

Red Hat announced the launch of Red Hat Enterprise Linux for SAP Solutions, a new platform that combines two existing systems for analytics and data management into a single

offering. The new platform combines the existing Red Hat Enterprise Linux for SAP Applications and Red Hat Enterprise Linux for SAP HANA into a single, consolidated platform.

Built upon the Red Hat Enterprise Linux 7 operating system, the platform adds a few new wrinkles which offers proactive analytics and real-time intelligence. It allows customers to build and deploy cloud-based systems while providing warnings about potential technical problems and security threats.

The new Red Hat platform definitely will enhance the customer experience. The new platform marks the latest collaboration in a long relationship between SAP and Red Hat, which have worked as partners in the open source space for about 17 years. Red Hat's open source OS, virtualization and Java middleware technologies provide a leading platform upon which to run SAP applications.

Customers migrating to SAP S/4HANA have been anticipating this new integrated platform, as it provides consistent infrastructure for both transactional and analytical workloads. The new platform demonstrates the growing acceptance of open source alternatives. Open source can enhance and extend the capabilities of traditional enterprise applications and tools, like those provided by SAP.

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**IT BULLETIN** **Date : 24.08.2017**

### **FINALLY ORACLE**

Oracle showed some very good numbers in its latest earnings announcement. It begins its second year of aggressive cloud promotion, the company overall is showing significant year-over-year improvements.

Oracle is the last major software vendor to adopt the cloud as its primary medium, and while it will support its legacy customers as long as necessary it has a good history of loyalty to customers in this regard there's no doubt about its direction. To make its pivot, Oracle has had to spin up three "as a Service" businesses: one for infrastructure, IaaS; one for software, SaaS and one for platform, PaaS.

Infrastructure is a low-margin business, because there's a lot of low-priced competition. Yet it's essential to the company's strategy, because there will be a fraction of its 425,000-plus customers that get to the cloud simply by moving the locations of their data centers. Without an IaaS business, those customers could go anywhere, and keeping them in the software fold would become more difficult. Oracle's transition to the cloud removes the last legitimate holdout the last objection to cloud computing almost anywhere.

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**IT BULLETIN** **Date : 28.08.2017**

### **PCS SHINE AGAIN**

The excitement is emerging from both the technology driving PCs and the applications leveraging the processing power of PCs. In terms of technology, the battle between AMD and Intel for processor supremacy has heated up again, along with a new core race.

Intel has countered with a new line of Core i9 processors that will feature up to 18 cores and 36 threads but at a price tag that puts the price of the processor alone at around \$2,000. In addition, the graphics processing unit soon will get a significant bump in performance, when AMD introduces new products on its Vega architecture and Nvidia launches products based on its Volta architecture.

The I/O on PCs is being upgrading to USB-C and Thunderbolt 3, and solid-state drives and memory are getting faster with larger capacities. These extreme systems won't have much of an impact on average consumers. The impact of a performance battle at the high end of the market is that mainstream PCs will see new technologies and substantial bumps in performance at much lower price points.

Gaming is the only area where PCs shipments actually have been growing. However, just on the horizon is a new generation of virtual reality and augmented reality head-mounted displays that hold the promise of improving the PC experience in just about every application from engineering and design to entertainment and gaming. On the positive side, however, is that power users account for more than a third of the overall PC market, by some estimates, and the their ranks are growing.

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**IT BULLETIN** **Date : 29.08.2017**

### **NVIDIA IS OFF TO THE AUTONOMOUS CAR RACES**

Nvidia recently announced that Toyota will use its Drive PX AI car computer platform for advanced autonomous vehicles slated for introduction over the next few years.



Nvidia is combining breakthroughs in AI and high-performance computing to build Nvidia Drive PX, the brain of the autonomous car, It's also noteworthy that the announcement states that it is to deliver artificial intelligence hardware and software technologies.

The Drive PX platform, equipped with the next-generation Xavier System on a Chip a palm-sized artificial intelligence-based supercomputer designed for use in autonomous vehicles delivers 30 trillion deep learning operations per second. It combines data from cameras, lidar, radar and other sensors.

It then uses AI to understand the 360-degree environment around the vehicle, localize itself on a high-definition map, and anticipate potential hazards while driving. Most everyone else is looking to turn the car into a rolling elevator. Toyota's effort to favor its guardian angel concept, which fully enhances a human but doesn't replace them by default.

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**IT BULLETIN** **Date : 01.09.2017**

**EAVESDROPPER VULNERABILITY EXPOSES HUNDREDS OF MOBILE APPS**

700 apps in the enterprise mobile environment, including more than 170 that were available in official app stores, could be at risk to due to the Eavesdropper vulnerability.

Affected Android apps already may have been downloaded up to 180 million times. The vulnerability has resulted in large-scale data exposure.

Eavesdropper is the result of developers hard-coding credentials into mobile applications that utilize the Twilio Rest API or SDK. Twilio already has reached out to the development community, including those with affected apps, to work on securing the accounts.

The vulnerability reportedly exposes massive amounts of sensitive and even historic data, including call records, minutes of the calls made on mobile devices, and minutes of call audio recordings, as well as the content of SMS and MMS text messages.

The best approach for an enterprise is to identify the Eavesdropper vulnerable apps in its environment and determine whether the data exposed by the app is sensitive. If the messages, audio content or call metadata turn out to be sensitive or proprietary, there may not be much that can be done about exposed conversations resulting from prior use of the app.

However, a lot can be done to protect future exposures, including either addressing and confirming the fix with the developer, or finding an alternate app that has the same or similar functionality without the Eavesdropper vulnerability.

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**IT BULLETIN** **Date : 07.09.2017**

### **MARCHER MALWARE POSES TRIPLE THREAT TO ANDROID USERS**

A three-pronged banking malware campaign has been infecting Android phones since the beginning of this year. Attackers have been stealing credentials, planting the Marcher



banking Trojan on phones, and nicking credit card information. The attack begins with a phishing message delivered by email to a phone, The message pretends to be from the target's bank and contains a link that often is obscured by a Web address shortener.

The link takes the victim to a bogus bank page where the bandits request the target's bank account or PIN information. Once the hackers have that information, they instruct victims to log into their accounts using their email address and password. All the information entered at the fake banking site is harvested by the hackers.

Instead of getting access to an account, banking customers get a popup message instructing them to install the bank's security app. About 7 percent of targets have downloaded the "security app," which is really the Marcher malware. Once installed, the malware asks for extensive permissions everything from receiving, sending, reading and writing SMS messages to opening network sockets, reading address books, changing system settings and even locking the phone.

In general, don't see a lot of crossover between phishing actors and those who distribute malware. The combination of the socially engineered banking Trojan download and multistep phishing attack that gathers credentials or financial information at each step, is fairly unusual.

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**IT BULLETIN** **Date : 12.09.2017**

**NOON HOME DEBUTS NEW WAY TO LIGHT UP YOUR LIFE**

New company Noon Home officially launched and simultaneously unveiled its Noon Smart Lighting System, after two years of raising funds and developing products in stealth mode. The Noon Smart Lighting System blends ambient, task and accent lights to layer lighting, improve the way a room looks, according to the company. It consists of a Room Director switch and companion Extension Switches, which communicate via Bluetooth Low Energy technology.

The Room Director, which has a glass touchscreen OLED display, clips into the Noon Base at the light switch. It lets users adjust all a room's lights once the system is installed. You can control the Noon Lighting System at the switch, through the Noon app, or via voice with Amazon Alexa. The Noon app runs on iOS and Android smartphones.

The Noon Smart Lighting System reads electrical currents and uses advanced algorithms to automatically detect and identify the type of bulb and fixture being used. The bulb learning capability is unique, and a nice differentiator. The system combines information about the bulb type with data about the fixture and room type to create light in three modes: Relax, Everyday and Bright.

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**IT BULLETIN** **Date : 14.09.2017**

**DATA WATCHDOG CAUTIONS GOOGLE AND UK HEALTH PARTNER**

A British data watchdog has raised questions about whether it was appropriate for a healthcare trust to share data on 1.6 million patients with DeepMind Health, an artificial intelligence company owned by Google. The trust shared the data in connection with the test phase of Streams, an app designed to diagnose acute kidney injuries.

The UK's Information Commissioner's Office also has been probing the matter, and is expected to complete its investigation soon. One of the concerns since the launch of the Streams project has been whether the data shared with Google would be used appropriately.

The data used to provide the app has always been strictly controlled by the Royal Free and has never been used for commercial purposes or combined with Google products, services or ads. Real patient data is routinely used in the NHS to check new systems are working properly before turning them fully live. Although there's no evidence of data abuse by DeepMind, the future fate of personal healthcare information is an issue that has raised concerns.

There's a concern that once these sorts of applications and use of these sets of big, personal data become more commonplace, it will lead to commercial use of the data. Google and DeepMind understand that anything they do is going to be hyper scrutinized through this lens of advertising revenue."

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**IT BULLETIN** **Date : 16.09.2017**

**MILLIONS MAY HAVE PICKED UP FALSE GUIDE MALWARE AT GOOGLE  
PLAY STORE**

As many as 2 million Android users might have downloaded apps that were infected with the FalseGuide malware. The oldest of the infected apps could have been uploaded to Google Play as long ago as last November, having successfully remained hidden for five months, while the newest may have been uploaded as recently. The malware has infected nearly 50 guide apps for popular games. Check Point alerted Google about the presence of the malware, and Google swiftly responded by removing the infected apps from its online app store.

These high levels are possible because the apps request device admin permission upon downloading. That is an unusual request, and it suggests malicious intent, as it prevents the user from deleting the app. FalseGuide registers itself to a Firebase Cloud Messaging topic with the same name as the app, which allows it to receive additional modules that then create a silent botnet. The makers of the FalseGuide malware likely wanted it to masquerade as game guides, which are popular and actually build on the monetary success of their related apps. They require very little development time and are limited in feature implementations.

This FalseGuide Malware did a great job of deploying via a few apps users wanted, and when people granted it top administrative privileges during installation, the malware was planted pretty deeply. One reason the infected apps have been able to fool users is that on the Android platform, The security model is pretty much all-or-nothing on permissions. When you install an app, it will ask for access to the network, or your contacts, or any of several other kinds of resources and commonly, you can't install the app without agreeing.

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**APPLE SLASHES APP STORE AFFILIATE COMMISSIONS**

Apple stunned the wider development community on Monday with an emailed announcement that it has decided to slash commissions for App Store affiliates from 7 percent to 2.5 percent. The cuts apply to all apps and in-app content. However, they do not apply to commissions for movies, music, books and TV, which will remain at 7 percent.

The company will continue to pay commissions on Apple Music memberships as well. Apple directed affiliates to read the Commissions and Payments page on its Affiliates Resources site for more information on the new policy.

Both the extent of the cuts and the brief notice provided they go into effect next week are surprising, and have given rise to speculation that the policy change may be part of a larger shift in Apple's recent revenue picture. It is interesting that they've kept the 7 percent intact for higher-value digital content.

The connection is not terribly clear, but presumably Apple wants to drive more revenue from subscriptions and higher-value content in general, so this may be a move to bias affiliate-driven traffic in those directions.

The plan centered around changing the 70/30 revenue share model to favor developers who attracted subscribers. If a customer remained a subscriber for a year, Apple would slash its 30 percent share to 15 percent, thus boosting the developer's take.

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**NEWLY REVEALED FLAW COULD SUBJECT IOT DEVICES TO  
AIRBORNE ATTACKS**

Billions of voice-activated Internet of Things devices may be subject to external attack due to BlueBorne vulnerabilities. Hackers could exploit BlueBorne to mount an airborne attack, using Bluetooth to spread malware and access critical data, including sensitive personal information. More than 20 million Amazon Echo and Google Home digital assistant speakers could have been impacted by the flaws, but both Amazon and Google already have taken the matter in hand. Amazon customers don't need to take any action, as its devices will be updated automatically with the needed security fixes.

The BlueBorne vulnerabilities could allow a man-in-the-middle attack, which would enable hackers to access personal data even if users don't visit any malicious sites, download any suspicious file attachments, or take any other direct action to enable it. The firm's researchers initially found the info leak and remote code execution vulnerability, and then tested Android, Windows and iOS devices to confirm the issues. While previous vulnerabilities were found at the protocol level of Bluetooth, BlueBorne resides at the implementation level, making it deeper and more serious than the others.

One critical point is that BlueBorne could become a "forever day" point of exposure, because Linux-based IoT devices have no clear upgrade path to address the vulnerability. IoT and intelligent home devices have been a growing area of concern for cybersecurity professionals.

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**RAZER PHONE**

The first smartphone from Razer, aptly called "Razer Phone" is targeted toward gamers, a natural move for the company. It has a 5.72-inch, 120-Hz Ultramotion display, 8 GB of RAM, Dolby Atmos-powered speakers directing audio toward the front, and a handy USB-C adapter for fans of modern headphones. There's no headphone jack, unfortunately. Razer Phone does include dual rear 12-MP cameras and 64 GB of expandable storage through microSD, and it is ready to support next year's Android Oreo. That screen refresh rate and undoubtedly strong audio make it a solid option off the bat for mobile gamers.

This handset seems a solid option for those in need of their gaming fix on the go. It doesn't seem to really fix my misgivings about the awkwardness of touch input for games (outside of casual titles), so pairing it with a controller is probably a good idea. You're considering playing all those classic Grand Theft Auto games on the train. Just to see how green the grass is on the other side with a handset I could see myself getting behind.

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**TAKE LINUX AND RUN WITH IT**

To unleash the full power of Linux, and maybe even find a use for it you hadn't thought of, consider some less conventional ways of running it specifically, ones that don't even require installation on a computer's hard drive. Live-booting is a surprisingly useful and popular way to get the full Linux experience on the fly. While hard drives are where OSes reside most of the time, they actually can be installed to most major storage media, including CDs, DVDs and USB flash drives.

When an OS is installed to some device other than a computer's onboard hard drive and subsequently booted instead of that onboard drive, it's called "live-booting" or running a "live session. At boot time, the user simply selects an external storage source for the hardware to look for boot information. Optical media are increasingly rare these days, so by far the most typical form that an external OS-carrying device takes is a USB stick.

Most mainstream Linux distributions offer a way to run a live session as a way of trying them out. The live session doesn't save any user activity, and the OS resets to the clean default state after every shutdown. Live Linux sessions can be used for more than testing a distro, though. One application is for executing system repair for critically malfunctioning onboard (usually also Linux) systems. If an update or configuration made the onboard system unbootable, a full system backup is required, or the hard drive has sustained serious file corruption, the only recourse is to start up a live system and perform maintenance on the onboard drive.

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**APPLE MAY HAVE FUDGED IPHONE X'S FACE ID**



Apple has reduced the accuracy of the iPhone X Face ID feature to speed up production. The iPhone X doesn't have a fingerprint scanner, and facial recognition is the only biometric unlock mechanism for a number of iPhone features. The quality and accuracy of Face ID haven't changed," the company maintained. It continues to be a one in a million probability of a random person unlocking your iPhone with Face ID. We expect Face ID to be the new gold standard for facial authentication. Customer interest in the iPhone X and Face ID has been "incredible,".

The iPhone X's facial recognition sensor projects the infrared dots to map faces. It uses a vertical cavity surface-emitting laser, or VCSEL, and is made of gallium arsenide. It beams light through a wafer-level optic lens. Both the VCSEL and the lens must be made to very high tolerances and are fragile. At one point, only about 20 percent of the dot projectors the two made were usable, although the usability rate is now about 50 percent.

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