



TECHNICAL

Newsletter

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Google unveils new smartphones, laptops and earbuds

Google has unveiled its latest flagship Android smartphone, the Google Pixel 4 which includes a radar chip that lets users control their phone through gestures.

The Soli radar chip is able to sense motion and users will be able to "skip songs, snooze alarms and silence phone calls" by waving their hand in front of the phone. The technology was developed internally by Google's Advanced Technology and Projects team.

The firm also boasted about the Pixel's new dual camera system that allows users to take astronomical photos.

Google said the new astrophotography mode is able to take detailed pictures of the night sky when kept completely still using the Pixel's Night Sight low-light photo mode. It can then use computation to piece together a number of different images to create the final shot.

The phone will ship with the latest version of Google's mobile OS, Android 10, which comes with a system-wide dark mode; new permissions features; improved facial recognition and enhanced security.

Google Assistant is also getting a revamp, with a better understanding of context when asked a question. It will supposedly be able to process voice commands up to 10 times faster than the current Assistant.

Google confirmed that the new phone will be available in either the 5.7-inch screen Pixel 4 (from £699) or the 6.3-inch Pixel 4 XL (from £829). The handsets will go on sale on 24 October.

Both versions support wireless charging and include "adaptive all-day battery", which uses machine learning to determine which apps are being used least frequently and cutting down power consumption of those when not in use.

Also announced at the special event was a new iteration of the Nest Mini (formerly the Google Home Mini), which has more powerful speakers with better bass than the previous generation.

It can also be integrated with other Nest powered speakers to create a surround sound system of sorts and you can use your voice to change which device music or podcasts are playing on as you move through the house.

Refreshes of Google's Chrome OS-based laptops were also demonstrated. Dubbed the Pixelbook Go, the device features a textured bottom panel and a 13.3-inch touchscreen.

Following the Pixelbook, which debuted in 2017 with a starting price of \$999 (£758), Google has slashed costs for the new generation by shifting to magnesium from aluminium for the laptop exterior and removing hinges and wiring that enabled the prior model to be used like a tablet.

The new model is priced at \$649 (£510) which could help broaden the device's appeal over the last generation, which sold poorly. Google said it has improved the design of components such as the trackpad to cut manufacturing mishaps and therefore costs.

Google also announced Pixel Buds, a set of wireless earbuds scheduled to launch in Spring 2020 in the US, priced at \$179. The company said it "scanned thousands of ears to create a design that's comfortable for as many people as possible." The 'buds include hands-free access to Google Assistant.

The Google Stadia game-streaming platform received a launch date of 19 November this year, with initial availability in the US, Canada, UK, Ireland, France, Germany, Italy, Spain, Netherlands, Belgium, Denmark, Sweden, Norway and Finland.

The service will launch with a \$129 Stadia Founder's Edition pack, which includes a Chromecast Ultra, limited-edition Night Blue controller and two three-month Stadia Pro subscriptions.



Nasa's Mars probe starts digging again after months stuck in the mud

Nasa's InSight spacecraft, which had to stop digging activities on Mars in March after it got stuck, has started digging again. The space agency said it has used its robotic arm to help its heat probe, known as 'the mole', dig nearly 2cm over the past week. Designed to dig as much as 5m underground to gauge the heat escaping from the planet's interior, the mole has [only managed to partially bury itself](#) since it started hammering in February 2019.

Scientists had hoped there would be a limited number of rocks below ground to impede the digging instrument as there are few rocks on the surface near the lander. But they were forced to abandon the plan just two days after the initial dig as scientists said rocks were blocking the probe's instruments.

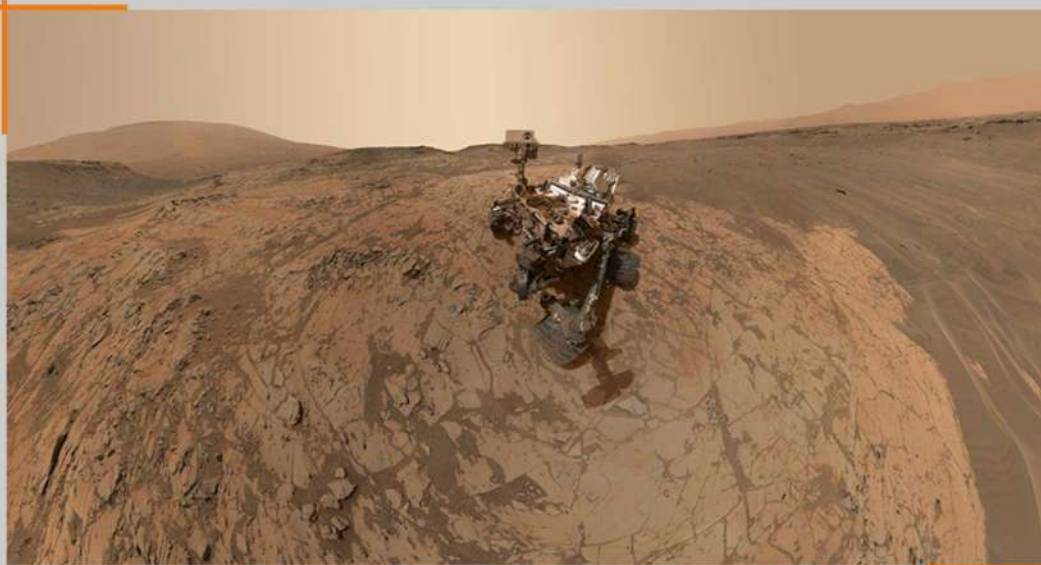
The recent movement is the result of a new strategy, arrived at after extensive testing on Earth, which found that unexpectedly strong soil is holding up the mole's progress.

The mole needs friction from surrounding soil in order to move, without it recoil from its self-hammering action will cause it to simply bounce in place. Pressing the scoop on InSight's robotic arm against the mole, a new technique called 'pinning' appears to provide the probe with the friction it needs to continue digging.

Since 8 October the mole has hammered 220 times over three separate occasions. Images sent down from the spacecraft's cameras have shown the mole gradually progressing into the ground. It will take more time – and hammering – for the team to see how far the mole can go.

"We're rooting for our mole to keep going," said the experiment's lead scientist, Tilman Spohn of the German Aerospace Centre. "When we first encountered this problem, it was crushing," said the Jet Propulsion Laboratory's Troy Hudson, who is leading the recovery effort.

"But I thought, 'Maybe there's a chance; let's keep pressing on.' And right now, I'm feeling giddy," he said. In April InSight recorded what is believed to be ["the first Marsquake"](#), which demonstrates some plate activity underneath the surface.



Nasa shows off new space suit for 2024 Moon missions

Nasa has demonstrated its new 'Orion' astronaut suit which has been designed to be stronger and more comfortable for those who wear it. The helmet is lighter, stronger, comes in more than one size, helps reduce noise and is easier to connect to the communications system needed to talk to other crew members and mission control.

The outer cover layer is orange to make crew members easily recognisable in the ocean should they ever need to exit the Orion capsule without the assistance of recovery personnel. The suit is a pressure garment that includes a restraint layer to control the shape and ease of astronauts' movements. A reengineered zipper also allows astronauts to quickly put the suit on and has increased strength.

Adaptable interfaces supply air and remove exhaled carbon dioxide, while the suit also has improved thermal management that will help keep astronauts cool and dry.

A liquid cooling garment is worn underneath the suit which has also been revamped to be more breathable and easier to build. The suit is a crucial component needed for the space agency's plan to return to the moon by 2024. Two Nasa engineers donned the new spacesuits at the agency's Washington headquarters, modelling and doing squats and crunches in front of a crowd of students and reporters.

"This is the first suit we've designed in about 40 years," said Chris Hansen, a manager at Nasa's spacesuit design office. "What you saw today was a prototype of the pressure garment. The life support system is back in a lab in Houston," he said. "We want systems that allow our astronauts to be scientists on the surface of the moon"

The Trump administration in March directed Nasa to land humans on the moon by 2024, accelerating a goal to colonise the moon as a staging ground for eventual missions to Mars.

Last month a top Nasa manager expressed doubts that the agency would be able to achieve the stated 2024 goal although he said the agency was doing its best.

The new suits come as a much-needed upgrade to Nasa's astronaut wardrobe. Astronauts Christina Koch and Anne McClain were slated in March to conduct the first ever all-female spacewalk outside the International Space Station, but the mission was called off because there weren't enough spacesuits available on the station for both of them.

Another attempt for the first all-female spacewalk, a roughly six-hour crawl on the exterior of the space station to fix its power systems, is due some time today. The women will replace a broken battery power controller, rather than install new batteries, which was their original job.

In related space news, also announced today were the first fruits of the partnership between Virgin Galactic and Under Armour, as the two companies unveiled the world's first exclusive spacewear system for private astronauts.

The collaboratively designed space wear system for Virgin Galactic astronauts consists of a base layer, spacesuit, footwear, training suit and Limited Edition astronaut jacket. Under Armour is the 'Exclusive Technical Spacewear' partner of Virgin Galactic, following the announcement in January 2019 that the two companies would be working together.



AI and Data Analytics Can Change The Face Of Healthcare Services In India

Technology can be transformative in healthcare services delivery, improving the quality of life, even where there is a density of doctors is one per thousands of people. Since AI, data analytics, machine learning among others have been transforming care services, India is one of the countries in the world with huge scope to improve medical treatment. With AI, data analytics and all the technology there, treatments can perhaps be done better in India as we go forward. Former NitiAayog Vice-Chairman Arvind Panagariya said, "India's health sector is still very much evolving and very informal as it is still largely dominated by the private sector and government's role largely had been into setting up medical colleges."

Tech Opportunity in India

As technologies can bring [healthcare services](#) closer to the community, India can be benefited from an integrated health information system (HIS) across all states. With this system, both doctors and patients will have the access to manage all aspects of healthcare planning, delivery, and monitoring, such as disease observation, patient medical records, planning for human resources, continuing medical education, facility registration, and telemedicine initiatives.

Over the last decade, the country has seen rapid diffusion in the internet and smartphones and now it is meeting the requirements for efficient delivery of digital care solutions. The interest for innovation from governments made technology is at an all-time high at the central policy level, along with at the local level. At present, every state is seeking to surpass each other at the adoption of new technology that can assist and support overcome old problems.

Arvind says "The biggest problem that India had was that in the rural areas and even in tier 2-3 cities, the qualified doctors just don't go and much of the provision is done by people who have just kind of learned the job or somebody who have worked as an assistant with a doctor."

The convergence of technological solutions with cloud computing, data analytics, telecommunications, and wireless technologies will also enhance the accessibility and manage shortages of skilled doctors or physicians more efficiently in the healthcare industry.

Need to Ease Challenges

In India, AI can potentially bound some other technologies, but to be used at any scale, digitalisation is a prerequisite. In many Indian healthcare centres, medical records are still paper registered, and radiology still uses films. Considering other countries, this scenario is changing rapidly.

Another challenge that needs to overcome is the cost of delivering medical services, which has been increasing steadily. When technological innovation is better incorporated with healthcare delivery, it can enable scale and minimise costs, stimulating adoption. This adoption will also be driven by the automation of critical processes in administration, finance, billing, patient records, and pharmacies.



New Technique Identifies Electricity-Producing Bacteria

Living in extreme conditions requires creative adaptations. For certain species of bacteria that exist in oxygen-deprived environments, this means finding a way to breathe that doesn't involve oxygen. These hardy microbes, which can be found deep within mines, at the bottom of lakes, and even in the human gut, have evolved a unique form of breathing that involves excreting and pumping out electrons. In other words, these microbes can actually produce electricity.

Scientists and engineers are exploring ways to harness these microbial power plants to run fuel cells and purify sewage water, among other uses. But pinning down a microbe's electrical properties has been a challenge: The cells are much smaller than mammalian cells and extremely difficult to grow in laboratory conditions.

Now MIT engineers have developed a microfluidic technique that can quickly process small samples of bacteria and gauge a specific property that's highly correlated with bacteria's ability to produce electricity. They say that this property, known as polarizability, can be used to assess a bacteria's electrochemical activity in a safer, more efficient manner compared to current techniques.

“The vision is to pick out those strongest candidates to do the desirable tasks that humans want the cells to do,” says Qianru Wang, a postdoc in MIT's Department of Mechanical Engineering.

“There is recent work suggesting there might be a much broader range of bacteria that have [electricity-producing] properties,” adds Cullen Buie, associate professor of mechanical engineering at MIT. “Thus, a tool that allows you to probe those organisms could be much more important than we thought. It's not just a small handful of microbes that can do this.”

Buie and Wang have published their results today in *Science Advances*.

Just between frogs

Bacteria that produce electricity do so by generating electrons within their cells, then transferring those electrons across their cell

membranes via tiny channels formed by surface proteins, in a process known as extracellular electron transfer, or EET.

Existing techniques for probing bacteria's electrochemical activity involve growing large batches of cells and measuring the activity of EET proteins — a meticulous, time-consuming process. Other techniques require rupturing a cell in order to purify and probe the proteins. Buie looked for a faster, less destructive method to assess bacteria's electrical function.

For the past 10 years, his group has been building microfluidic chips etched with small channels, through which they flow microliter-samples of bacteria. Each channel is pinched in the middle to form an hourglass configuration. When a voltage is applied across a channel, the pinched section — about 100 times smaller than the rest of the channel — puts a squeeze on the electric field, making it 100 times stronger than the surrounding field. The gradient of the electric field creates a phenomenon known as dielectrophoresis, or a force that pushes the cell against its motion induced by the electric field. As a result, dielectrophoresis can repel a particle or stop it in its tracks at different applied voltages, depending on that particle's surface properties.

Researchers including Buie have used dielectrophoresis to quickly sort bacteria according to general properties, such as size and species. This time around, Buie wondered whether the technique could suss out bacteria's electrochemical activity — a far more subtle property.

“Basically, people were using dielectrophoresis to separate bacteria that were as different as, say, a frog from a bird, whereas we're trying to distinguish between frog siblings — tinier differences,” Wang says.



These internet browsers will alert you if your data gets stolen

The internet can be a very unsafe place for your personal data to exist on as there is no saying when it would fall prey to the eye of some [hacker](#). From big corporate organisations to an individual, data is a commodity that can be put by hackers to their own malicious uses like extortions. In light of data breaches like Facebook's Cambridge Analytica scandal and attacks by WannaCry and Petya ransomware that targeted the devices used by employees of big organisations, major search engines in the world seem to be battening their hatches to deal with these threats. Case in point: Mozilla and [Google](#).

Mozilla's [Firefox 70](#), the latest browser version by the American firm, has been updated with new features like social tracking protection, a Privacy Protections report and a password management tool that alerts you in case of [data leak](#).

Mozilla's has added social media trackers to its Enhanced Tracking Protection feature which means that all the tracking requests from major platforms like Facebook, WhatsApp, Instagram, Twitter, YouTube and LinkedIn, will be rejected and blocked.

The Privacy Protections report will list out the trackers that tried to access your browsing activity and there is the Lockwise password management tool that alerts you when your saved login data gets leaked. [Firefox 70](#) has been launched for Windows, Mac and Linux platforms.

In recent news, the German Federal Office for Information Security rated Mozilla Firefox as the most secure internet browser above Chrome, Edge and Internet Explorer. Having said that the agency did not compare it with Safari, Opera or other browsers.

This agency advises government officials in Germany on cyber security risks and asked officials to use Firefox. The areas where Chrome, Edge and Internet Browsers failed is lack of support for a master password mechanism along with other issues like there is no built-in update system in Internet Explorer. In all the three browsers, there is no provision to block telemetry collection and lacks in organisational transparency.



Credit and debit card details of 13 lakh Indians on sale: RBI tells banks to probe, if required reissue cards

HIGHLIGHTS

- Critical card details of 1.3 lakh Indians were being sold at a price of \$ 100 per card on dark web.
- The value of the leaked database has been estimated by the group at \$ 130 million (£ 100 million).
- There were about 51.7 million credit cards and 851.5 million debit cards in circulation as of August.

Earlier in the day, reports of a debit and credit card detail selling online came up, revealing a massive risk of privacy on 13 lakh Indian credit and debit card users. Now the Reserve Bank of India(RBI) has swung into action in order to safeguard the interest of these affected Indian customers.

RBI in a notice to banks has said that they should secure the customers' data by performing a preliminary analysis of the leaked card information online.

"On finding leaked data to be correct and genuine, disable and re-issue the credit and debit cards as per the bank's policy," said the RBI notice dated October 29.

Security researchers at Singapore-based Group-IB discovered that critical card details of 1.3 lakh Indians were being sold at a price of \$ 100 per card on dark web. The value of the leaked database has been estimated by the group at \$ 130 million (£ 100 million).

"We do not disclose the names of banks, but can tell that the database held the credit and debit card dumps related to the largest Indian banks," Group-IB said in a statement on Thursday, adding that it had informed authorities about the breach.

There were about 51.7 million credit cards and 851.5 million debit cards in circulation as of August, RBI data shows.

"The (RBI's) Department of Banking Supervision has sent out this letter as whenever there are some incidents the RBI alerts the banks and sends them a cautionary note which is sent to all the scheduled commercial banks," said an industry official, requesting anonymity.

Banks have also been asked to inform the government's CERT-In department, which is responsible for emergency response, regarding the steps taken by them.

Regulators have often issued advisories to prevent data breaches which are frequent in India, a country of 1.3 billion people where the use of payment cards and digital wallets is rising rapidly.



TCS wins record 2.25 billion Nielsen contract, Accenture gets Vatican deal

Tata Consultancy Services Ltd. (TCS) has set a record by winning a 2.25 billion dollar outsourcing contract from television measurement company Nielsen. The contract is the largest ever bagged by an Indian information technology firm.

The TCS deal marks the renewal of the company's relationship with Nielsen. The television measurement company awarded TCS a 1.2 billion, 10 year contract back in 2015 which was later doubled to 2.5 billion and extended till 2020.

Nielsen's outsourcing contract has now been extended till 2025. The 2.25 billion dollar deal assures TSC of 320 million dollars in business from Nielsen yearly from 2017 to 2020, 186 million dollars yearly from 2021 to 2024 and 139.5 million dollars in 2025.

The renewal of the deal is considered to boost the profile of Rajesh Gopinathan who became chief executive officer of TCS in February, 2017 after N.Chandrasekaran was appointed chairman of Tata Sons Ltd - the holding company of the group.

Nielsen's statement reads as follows - "The term of the Agreement has been extended for an additional five years, so as to expire on December 31, 2025, with three one-year renewal options granted to Nielsen. TCS will globally provide Nielsen with professional services relating to information technology (including application development and maintenance), business process outsourcing, client service knowledge process outsourcing, management sciences, analytics, and financial planning".

Accenture's Vatican outing

The Vatican has just hired consulting firm Accenture to simplify and unify its digital communications. The Vatican's communication department has asked global consulting firm Accenture to set up a channel called 'Vatican News' in a bid to simplify and unify its digital communications.

The Vatican hopes the channel will help them communicate with the faithful in a more effective manner. They hope Accenture will help establish a clear digital communications strategy for the Church - all under one unified portal.

A beta version of the 'Vatican News' website has already gone live. The website not only contains news about the Church, Pope and Vatican in six different languages but also lets users scroll through Pope Francis's Instagram feed.

TCS awarded \$2.25 billion outsourcing contract by media research company Nielsen

