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In This Issue..

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Wishlist of a manager in 2020. How an ideal fresh graduate looks like?

Time is changing fast and time is on a fighter jet when it comes to IT industry. I still remember good old days of our time when we used to practice C Language pattern drawings by using Printf functions and for loop tricks.

Recursion was from one of the tough problems and file handling in C language was like Nirvana to a fresh graduate. No, I am not criticizing our time. That was equally tough task and most of the fresh graduates can't implement multiple type of Queues in C language.
Data Structure, Database, C Language, Compiler, Operating Systems and Computer Networks are still hot in the market and always going to be. But for a very limited and demanding positions.

For most of the jobs (which we do in our day to day practice). I just want a candidate should be able to:

- Use Git and Github and should know how to take checkout from the said branch. Should be smart enough not to merge wrong code in the master branch.
- Should be able to ssh to remote machine and should know about ftp/scp to transfer file.
- Should be able to write sql to create database, database tables and can create relations among tables.
- Should be able to understand the relation between interface, class and object.
- Should know Javascript. I am skipping Java, because Java is must   and we expect it from everyone.
- Should know about REST APIs and should have implemented atleast one framework out of Express, Django, or Springboot.

Good to have skills:
- A dream comes true if candidate have very basic knowledge of Docker and Kubernetes.
- Candidate can write unit test for his own code and can show the code coverage then managers can have wrestling to win the candidate.

AWS Cloud, Azure Cloud, Lambda functions, S3, CI/CD Pipeline (Jenkins) etc. You can ignore for first interview but trust me, you are going to learn it very first week and that too on fasttrack. You are going to spoil your nights in CI/CD pipelines issues.

Don't forget about covering the basics of Postman client. You can thank me later for the Postman client tip (as there are high chances that your first TL might be a tester).

You are feeling overwhelmed with too much stuff. This is not too much, just a task of 10 days (@ 4 hours/day).

So, you are welcomed to the real world and I have leaked the secret of managers.

Google's AI can design computer chips in under 6

In a recent Google AI blog post, lead Jeff Dean, scientists at Google Research and the Google chip implementation and infrastructure team described an AI technology that can design computer chips in less than six hours.

The team explained the process in a published paper where it talked about a learning-based approach to chip design that can learn from experience and improve over time, becoming better at generating architectures for unseen components. They claim that this technology can complete designing computer chips in under six hours on average, which is significantly faster than the weeks it takes human experts in the loop.

According to the company, the new technology advances the state of the art in that it implies the placement of on-chip transistors can be largely automated. If made publicly available, the Google researchers' technique could enable cash-strapped startups to develop their chips for AI and other specialised purposes.

Additionally, such a development can shorten the chip design cycle, which will allow hardware to adapt better to rapidly evolving research.

Explaining the process, the blog post stated — in essence, the approach aims to place a "netlist" graph of logic gates, memory, and more onto a chip canvas, such that the design optimises power, performance, and area (PPA) while adhering to constraints on placement density and routing congestion. The graphs range in size from millions to billions of nodes grouped in thousands of clusters, and typically, evaluating the target metrics takes from hours to over a day.

The researchers devised a framework that directs an agent trained through reinforcement learning to optimise chip placements. Given the netlist, the ID of the current node to be placed, and the metadata of the netlist and the semiconductor technology, a policy AI model outputs a probability distribution over available placement locations, while a value model estimates the expected reward for the current placement.

Quantum Computing: Not a Near Future Technology

Advancements in Quantum computing are seen as a positive sign, but the hype can also result in the slowing of the development. While awareness about Quantum computing is undoubtedly a good thing, experts fear that the hype about it might slow down its development. Quantum computing is a breakthrough technology that can solve some of the world's hardest problems in transportation, medicine, and computer security, among others that have not been foreseen yet.

Experts believe that the best of what quantum computing has to offer is still not here. The announcements of records broken and the developments in this technology are essential to encourage interest and investments in further research. It also influences governments to promote the development and updates the industries about the direction of technical development they need to adopt, in order to fully leverage to the power of quantum computing when it is ready to deliver to the enterprise. "The future of practical quantum computing relies on giving more developers and researchers the access and tools they need to build quantum applications," said Vern Brownell, CEO of D-Wave in a press release last month.

However, the hype of what the technology can do also creates the risk of disillusionment that can result in the slowing of the progress in the short run. There is an assumption that quantum computers are a faster and better version of computers that we have now, but that is not true. Quantum computers solve different problems in different ways. Considering the history of this technology, Quantum computers were proposed in 1982 to tackle issues in quantum mechanics that regular computers will not be able to handle.

This year at the 2019 Consumer Electronics Show (CES), IBM unveiled the IBM Q System One, an integrated universal approximate quantum computing system designed for scientific and commercial use. These systems are designed to tackle problems that are currently seen as too complex and exponential for standard systems to handle. This could just be the birth of solutions that could very soon handle these complex problems easily.

Arvind Krishna, Senior Vice President of Hybrid Cloud and director of IBM Research, in a press release mentioned that the IBM Q System One is critical in expanding quantum computing beyond the walls of the research lab to develop practical quantum applications for business and science.

Currently, there are not any written programs, for example, for financial projections on a quantum computer. The reason is that there have not been any quantum computers to deploy them on for due diligence. But lately, academic, corporate and government groups have built machines that can isolate and manipulate particles or other types of qubits well enough to handle basic programs.

Experts predict that in the next 3-5 years, quantum machines will perform precise calculations that would not be possible using ordinary computers. For this technology to reach that stage of maturity, governments need to support basic research. The industrial community also needs to start working with the current generation of quantum computers to develop the know-how and the software that will give them an edge as the technology improves.
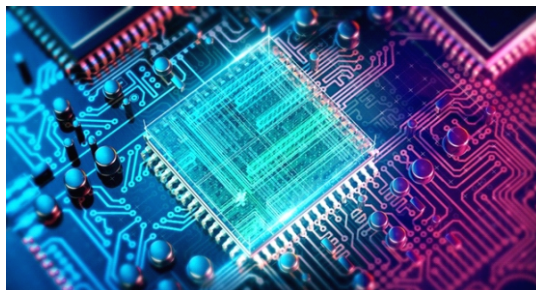
Digital molecule designer Schrödinger taps Google Cloud for parallel computing

An agreement with Google Cloud comes on the heels of Schrödinger's Nasdaq IPO last month, which raised about $232 million, to help boost its own early pipeline of internally developed drugs.

Schrödinger aims to upload its digital drug discovery efforts to Google's cloud network with plans to employ thousands of processors to simulate billions of potential compounds per week.

The three-year collaboration with Google Cloud is designed to substantially increase the speed and capacity of its physics-based molecule modeling platform, the company said, with supercomputer-level power being distributed among nationwide centers.

"We're excited to harness Google Cloud's highly scalable system to run extensive free energy calculations to assess binding affinities through our compute-intensive FEP+ application," said Schrödinger's chief information officer, Shane Brauner, describing the company's program for virtually screening the strength of potential ligands.

"This partnership is expected to allow us to expand the use of our physics-based computational platform to continue to rapidly explore very large swaths of chemical space," Brauner said in a statement.

The agreement comes on the heels of Schrödinger's Nasdaq IPO last month which went on to raise about $232 million—to help boost its own early pipeline of internally developed drugs. Plus the $110 million the company raised in venture funding last year, the proceeds will support at least five wholly owned programs launched since mid-2018.

Those efforts are focused on discovering and developing small-molecule inhibitors for targets in DNA damage response pathways and related cancers, the company said in its Securities and Exchange Commission filings. It plans to launch IND-enabling, preclinical studies by the first half of 2021.

But Schrödinger is also continuing to provide its drug discovery services to Big Pharma companies. Earlier this year, it inked a five-year deal with Bayer to digitally screen therapeutic candidates, following similar pacts with Sanofi and AstraZeneca.

Considering the Use of Ultraviolet Light Sources to Produce Advanced ICs

Scientists at Tokyo Institute of Technology have recently developed an extremely low-density tin 'bubble' which makes extreme ultraviolet reliable and cheap to generate.

The Tokyo Tech team has achieved this by creating tin thin-film spheres using a polymer electrolyte "soap bubble" made from polyelectrolyte—which are extremely stable and suitable for mass production—as a template and irradiating it with a laser.

Once the spheres were irradiated, the research team was able to confirm that extreme ultraviolet (EUV) rays of 13.5nm were emitted, the same as metallic tin. It is thought by the research team that their novel technology could pave the way for various applications in electronics like advanced semiconductors, as a reliable means of EUV light generation.

The Use of EUV in Advanced Ics

High-intensity lasers have been used to generate EUV light in the past, however, it has proven challenging for these lasers to maintain control of a target density that can produce light in the EUV range.

Working with colleagues from University College Dublin, the Tokyo Tech team set out to find laser targets that could be used to generate EUV light while remaining efficient, scalable, and low in cost. Their tin-coated microcapsule 'bubble' technology is a low-density structure that can be highly controlled. It consists of polymer electrolytes which are then coated in tin nanoparticles.

Suitability for Manufacturing Semiconductors

To put the bubble to the test, the research team irradiated it using a neodymium-YAG laser. This resulted in the generation of EUV light in the 13.5nm range, with the team also finding that the structure was compatible with the conventional EUV light sources that are used to manufacture semiconductors.
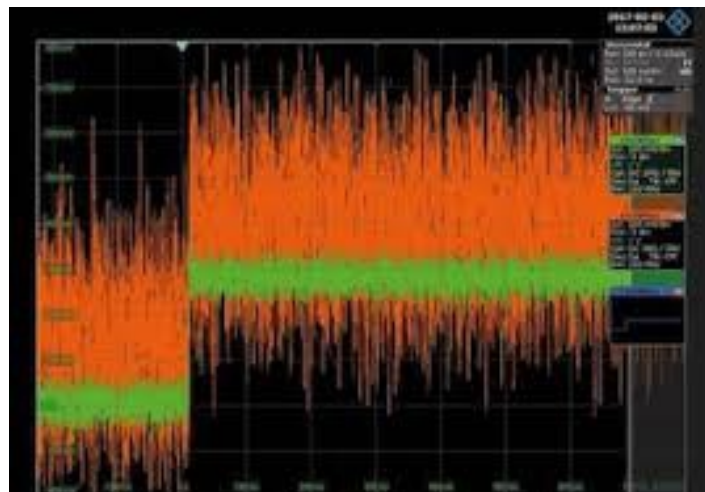
Cyber attack fears high due to work from home: NTRO

The government has advised government employees working in critical sectors to be vigilant, and closely monitor privileged users and administrators of critical accounts. India's critical sectors may fall prey to inimical forces which could use relaxations in geofencing restrictions granted to employees working from home to make cyber attacks, said an assessment by the National Technical Research Organisation (NTRO). Sectors including government undertakings, strategic and public enterprises, banking and financial services, telecom, power, energy and transport, among others, are susceptible to such attacks.

"In view of the lockdown, several critical sector entities have relaxed their geofencing restrictions to allow their personnel to log-in and work from home. This has increased the attack surface available to threat actors (cyber criminals) from neighbouring countries. Another modus operandi being used by them is to send out legitimate-looking coronarelated advisories impersonating as officials from the government and health organisations, through malicious e-mail attachments," said an official from the National Critical Information Infrastructure Protection Centre (NCIIPC). These impersonators are seeking donations for Covid-19 and trying to steal credentials for online fraud. Recently, the government had to issue a clarification over cyber criminals sending e-mails and WhatsApp messages stating that the government of India was giving Rs 1,000 to those under the socalled Corona Sahayata Yojana scheme. The message requires people to click on a link and provide their bank details and other information. The Centre on Sunday clarified the claim and the link were fraudulent and warned people against clicking on it.

"There has been a notable increase in the number of domains created using the words 'Corona' or 'Covid-19'. A vast majority of these are malicious, aimed at stealing credentials. Those who have visited such domains are advised to 'reset' their passwords immediately," cautioned another official from the Ministry of Home Affairs (MHA). The NCIIPC under NTRO has issued guidelines that include application whitelisting, blocking unused ports, turning off unused services and monitoring network traffic to prevent such attacks.

The government had advised government employees working in critical sectors to be vigilant, and closely monitor privileged users and administrators of critical accounts. "Track all CRUD (create-read-update-delete) activities in Identity and Access Management (IdAM). Focus on resilience of backups against ransomware attacks," it said.

The MHA had, earlier this month, issued an advisory on the use of Zoom meeting platform by private individuals, government officers and by officials for official purposes, stating that the platform is not safe. "The guidelines have been issued to safeguard private individuals who would still like to use the platform for private purposes. The broad objective of this advisory is to prevent any unauthorised entry into a Zoom conference room and prevent the unauthorised participant to carry out malicious attacks on the terminals of other users in the conference.

Walmart Labs will hire 2,800 in India this year

Since its inception in Bengaluru in 2008, Walmart Labs India has built cross-disciplinary teams engaged in cutting edge engineering, product development and data sciences. Over the rest of this year, it plans to hire about 800 people in its new centre in Chennai, and recruit 2,000 in its centre in Bengaluru, which already has some 3,500 people. In Chennai, where it leased a 250,000 sqft facility from RMZ earlier this year, it has openings for data engineers who will be part of Walmart's global data organisation (GDO), which is building machine learning, data science, and visualisation platforms. The group also develops analytical products for verticals like marketing, finance, supply chain, pricing, customer and HR.

The plan is to gradually ramp up the Chennai centre to 2,000 people over the next two years, sources told TOI. An e-mail to Walmart Labs asking about its plans did not elicit a response till the time of going to press. Walmart, and rival Amazon, are two companies that have seen their share prices rising through much of this pandemic, as customers shift to more affordable products, to online buying, and eat out less.

Since its inception in Bengaluru in 2008, Walmart Labs India has built cross-disciplinary teams engaged in cutting edge engineering, product development and data sciences.

Its India engineers have helped build the tech stack for the US supply chain, they have been developing tech solutions for Mexico's e-commerce platform. They are reimagining in-store and online shopping experiences, making them more seamless for millions of daily shoppers. Each week, Walmart has 260 million customers visiting 11,698 stores across 28 countries; it has e-commerce websites in 1 countries. It employs 2.3 million people.

Walmart's technology behind NextDay delivery was built in partnership with teams in India, San Francisco and Bentonville.

The India labs team has been instrumental in developing Optima, a solution that uses algorithms to generate optimised in-store pick walks for grocery orders. It solution has significantly reduced the total time taken and distance travelled by store associates to pick up orders from the shop floor. The team has developed several IoT solutions. For example, a temperature fluctuation in a US store can trigger an alert in Bengaluru, which then allows teams here to take action.

Fluid Robotics' underwater drones map Mumbai drains

Sewage water from over 200 nalas (drainage channels) join the course of the Mithi river -- around 11 kilometres from Vihar lake to Mahim -- in Mumbai, before it reaches the Arabian Sea.

These nalas, traditionally stormwater drains where the heavy monsoon rains would overflow, have now ended up carrying sewage of the city's growing population.

As India's business capital grew, it lost count of the nalas, till a local startup was contracted to survey them using underwater drones. Fluid Robotics, founded by the husband-wife duo Asim Bhalerao and Nidhi Jain, builds underwater drones or robots that can be sent into pipes and drains. The drones, which are easy to assemble, carry sensors that can measure water flow; scan the structure of the pipes for defects and also do geographic information system (GIS) mapping.

These have been among the first GIS maps that the Municipal Corporation of Greater Mumbai generated for the network of drains that link the Mithi river. "Using these drones, we could complete the entire mapping and processing in two weeks," says Rupesh Gundewar, Principal Consultant with Frischmann Prabhu India Ltd, an engineering consultancy that was tasked by the corporation to map the drains. "Using conventional methods, it would have taken several months". Bhalerao, a robotics engineer who returned from the United States, set up Fluid Robotics in 2016 after he found that a broken water pipe to the housing complex of the Tata Institute of Fundamental Research (TIFR) had not been fixed for a few months.

"At TIFR, they have a particle accelerator - the most advanced scientific instrument - and just outside, to find the leaking pipe, they were using sounding rods," says Bhalerao. Using sounding rods to find leaks in pipes is a centuryold concept that has been replaced globally by sensors that can track water flow. Bhalerao also found that most cities in India did not have maps of water pipelines and nearly 50% of the municipal water was lost in distribution.

Nidhi Jain, who is a software engineer, has built the machine learning algorithm and the visualisation software that enables Fluid Robotics to offer a data driven solution to municipal corporations for decision making.The underwater drones could be physically sent inside a drain or sewage pipe, to map.

Additional sensors could also be installed in the drones to study the chemical composition of the sewage, which would help health professionals during a crisis.

Based on the success of the Mithi river and an earlier experiment with Powai lake, the Municipal Corporation of Greater Mumbai is adopting drone technology to map the waterflow of all lakes in the city, says Gundewar of Frischmann Prabhu India.

Government Launches App Challenge to Develop Zoom Alternative

The government has launched a video conferencing app development challenge with prize money of Rs. 1 crore. The innovation challenge has been introduced at a time when security issues have been highlighted in the popular Zoom video-conferencing app. "Innovation Challenge for Development of Video Conferencing Solution". A huge amount of information is being shared online, giving rise to concerns over the privacy of the conversations and control over the app and data shared through the app.

The video conferencing app should be able to work on any suitable device, in poor connection it should have secured communication, and should use less power.

Recently the government issued an advisory cautioning against using Zoom app. The Cyber Coordination Centre of Home Ministry said that the app should not be used by government official owing to security concerns. Earlier, CERT-In, India's nodal agency that deals with cyber-security threats, had also warned that the Zoom video conferencing app may be vulnerable to cyber-attacks. Several organisations like Google and Standard Chartered have asked their employees to not use Zoom.
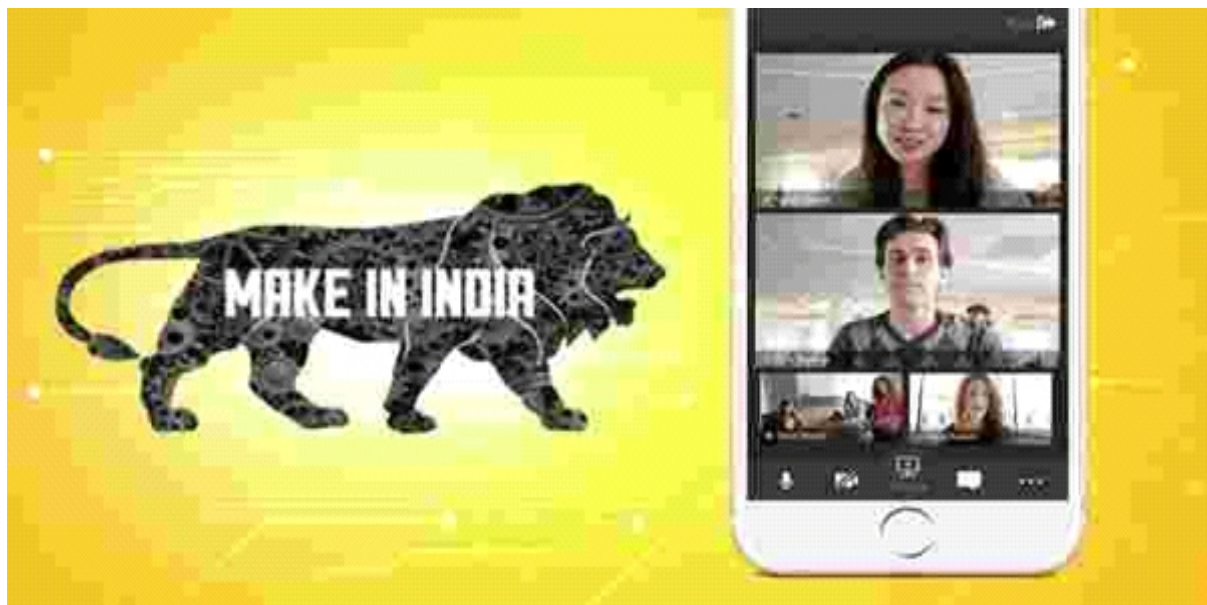
Xiaomi launched Mijia Scooter 1S with Range 30km and 25kmph Top Speed

Mijia Scooter 1S is the latest electric scooter to join the Mi ecosystem of products. While you don't see too many electric scooters - especially ones that aren't as large as regular petrol-driven scooters - in India, this kind of vehicle is very popular in the rest of the world. Xiaomi has been marketing a range of compact electric scooters for some time now in its home market of China, and it has now launched Mijia Scooter 1S. Priced around Rs. 21,700 the Mijia Scooter 1S is currently available on various e-commerce platforms in China with the option to ship internationally.

According to reports the Mijia Scooter 1S has a range of 30km on a full charge, with a DC motor that is rated for up to 3,000 hours of use. The scooter is capable of a top speed of 25kms per hour, and features disc brakes with ABS. The scooter weighs just 12.5kg, and can take up to 100kg of load on its footboard during operation.

The scooter additionally features various operation modes, including energy saving, normal, and sports mode. There's also a display at the top that serves as a dashboard; this gives varied information about the scooter including speed, battery, and any issues with the scooter. The tires are inflatable, and the body of the scooter is made with aircraft-grade aluminium alloy.

COVID-19 Test Developed by IIT Delhi

A method to detect COVID-19 which will reduce the cost of testing, making it affordable for a large population in the country, developed by Indian Institute of Technology Delhi has got the approval from the ICMR. The development also comes against the backdrop of the Indian Council of Medical Research (ICMR) halting the testing for COVID-19 cases through China-made test kits because of massive variation in test results, compounding the challenge to check and contain the pandemic. According to officials The current testing methods available are "probe-based" while the one developed by the IIT-D team is a "probe-free" method, which reduces the testing cost without compromising on accuracy.

Using comparative sequence analyses, the IITD team identified unique regions (short stretches of RNA sequences) in the COVID-19 and SARS COV-2 genome.

RNA or Ribonucleic Acid is one of the major biological macromolecules that is essential for all known forms of life. It performs various important biological roles related to protein synthesis such as transcription, decoding, regulation and expression of genes.