

A Department of MCA Initiative

PIZADA

Insights, Innovations, and Discoveries

VER.15



Nehru College Of Engineering
& Research Centre



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EDITORIAL

Hi,

We are thrilled to present the 15th edition of Pizada, where we bring you the most exciting and innovative developments in the world of tech.

In this issue, we delve into the latest trends in artificial intelligence, the emerging field of Esports, and the world of Cybersecurity. We also take a look at the latest developments in Blockchain, Darkweb and AI Modelling Language as well as providing in-depth reviews of the hottest trends in tech world.

We would also like to take this opportunity to thank our talented team of writers, editors, designers, and photographers, who have worked tirelessly to bring you the very best content. Their passion and dedication are what make this magazine possible, and we are grateful for their hard work.

As always, we welcome your feedback and suggestions. Please feel free to reach out to us and let us know what you think.

Thank you for your continued support, and happy reading!

Sincerely,

The Editorial Team

EDITORIAL TEAM



Pramod K
● Executive Editor



Basil Jiji
● Managing Editor



Jomin C Joy
● Chief Editor



Dhanush U
● Magazine Designer



Shibin Shanty
● Printing & Publication



Adarsh R Nair
● Photography

ABOUT COVERPAGE



Some of you may have noticed the cover page of Pizada. It seems like a fine art by a professional artist?. What if I say that image is created by an AI named DALL-E. The image is only one piece of art in the entire world which is generated by DALL-E. In January 2021, OpenAI released a groundbreaking new technology called DALL-E, which uses artificial intelligence to generate high-quality images from text descriptions. DALL-E has the ability to create complex and detailed images from written descriptions, such as "Robot sitting in a chair" or "a snail made of harp strings." This is made possible through a process called "conditional generation," where the model uses the text input as a guide for generating the corresponding image. Till date DALL-E allows the use of images for commercial purpose. So it's free to use the image generated by DALL-E. DALL-E represents a major breakthrough in the field of AI and has the potential to revolutionize the way we think about image generation. Its ability to create realistic and detailed images from text descriptions opens up new possibilities for creative expression, virtual reality, and much more.

“In memories of



Late.Sri.P.K.Das
Founder Chairman ,NGI

Whenever we hear the name, Nehru College, immediately the name of our beloved Chairman Sri PK Das comes to our mind. Our Chairman name is synonymous with Nehru Colleges, which stand as Hall Mark of Quality in the field of higher education Starting from scratch in 1968, this great leader, spent each ounce of his energy and sweat to establish the Nehru Group of Institutions in Kerala and Tamil Nadu.

”



Adv.Dr.P.Krishnadas
Chairman,Managing
Trustee, NGI

Team MCA deserves praise not only for their consistency in organizing and hosting the South Zone Inter Collegiate Technical Meet 'Prayaana' for the 15th time in a row but also for improvising and raising the bars of performance. Above all the cultural evening of Prayaana, I'm sure, will live up to the traditions of MCA department for showcasing the aesthetics of the best specimens of Indian fine arts. I wish a grand success for Prayaana and look forward for more glorious editions in the coming years.



Adv.Dr.P.Krishnakumar
CEO & Secretary, NGI



Dr. K. Karibasappa
Principal,NCERC

It gives great pleasure and pride to release the 15th edition of PIZADA - the annual Tech Magazine.I am glad to see that the 15th edition of MCA Technical Magazine Pizada, containing articles by students and Faculty members, as well as various relevant technology updates is being published during Prayaana2023.

I am very glad to see that the MCA department is bringing out the magazine "PIZADA". The magazine contains a good number of technical articles and papers highlighting the modern trends in compiyter applications. I congratulate all the students and faculty members, who have worked hard to bring out this publication and I sincerely wish them continued success in future



Dr. Ambikadevi Amma
Dean & Student Welfare,
NCERC



Dr.Sudheer S Marar
HOD, Department of MCA

My dear PIZADA team,
I understand, PIZADA means 'Footprints'.
I find this 15th footprint of PIZADA, illminatingly interesting

NGI-Gurukul

Team MCA appifies varied progressions to outstretch the fragrance of learning



Dr. Sudheer S Marar
Professor and Head
of MCA, NCERC

Applications play a vital role in all Computer domains as it is an end-user program that enables the users to do many things in an Information system. These applications form the core of any Computer based modus operandi systems. Today in digital era, We live in a world of diversified apps..! Lifestyle apps, Social apps, Entertainment apps, Communication apps, Governance apps.. At this point, applications are an integral part of our daily lives; even businesses that never would've needed apps in the past, are now rapidly getting into the game. Applications which allow performing explicit tasks are available for PCs, Mobile devices & Media platforms. The notion that 'technology is the application of science', reasons the precise selection of appropriate knowledge, the adoption of various criteria and the re-shaping of knowledge to make it acquiescent to the technologist.

Till few years, smartphones and TabletPCs were considered a source of distraction for students. Parents and teachers were keen on doing everything in their power to keep students away from these machines. But with the advent of ubiquitous and affordable internet and the recent COVID situation, mobile apps have turned smartphones into virtual classrooms. They have introduced various educational apps that make focusing rather than getting distracted easier. Furthermore, these educational apps make the learning experience more interactive, thus encouraging students to learn.

Educational learning apps are designed to be engaging and enjoyable for students. Knowledge augmentation, tailored learning experiences, improved engagement, access to online study material, ease of communication, and, most significantly, remote access are all advantages of a learning app.



During the global pandemic, the education sector has seen a massive expansion of technology. With technology on its side, the entire industry is discovering new ways of doing things. It's not that technology has not been used in education before, but the use of educational applications has been limited. Using technology used to be a choice, but now it's a requirement. This has led to the adoption of educational software development via mobile applications, allowing companies, particularly in the education sector, to reach new heights.

The education industry has undergone a huge transformation. With the arrival of apps, learning has become easily accessible, which makes it much more interesting for students of all ages. Ancient Indian Philosophy has always advocated learning to be a lifelong impression, and age is no bar for the Godly concept called Learning. Educational apps now bridge the communication gap between Teacher and Students.. NGI Gurukul is one such Application to foster Knowledge delivery..

NGI Gurukul is an Online Learning Platform offered by the Nehru Group which envisions sharing knowledge among the stakeholders. The facility would serve not just NGI Students, but also would enlighten the general public who wish to avail data on a specific domains offered by the Learning App.

Education Mobile App development offers numerous benefits in the training industry. Students are more driven towards using a mobile phone for every purpose, thus app is the perfect way to attract students to learn and enhance their skills. NCERC's MCA department has already devised many such models including NeCTAR Conference Platform, nPods Podcasting App & nAppIER Data sharing App..

The advertisement features a smartphone displaying the NGI Gurukul app interface. The app screen shows the Nehru Group logo, the text "gurukul", and "Elevate. Entertain. Engage.". To the right of the phone is the NGI Gurukul logo, which includes the Nehru Group emblem, the text "NEHRU GROUP OF INSTITUTIONS", and the tagline "Meeting True Goals". Below the logo, the text "NGI Gurukul" is written in large, bold, brown letters, followed by "the Educational App from Nehru Group". A blue circle with a white downward arrow icon is positioned next to the text "FREE DOWNLOAD". Below this, there is a "GET IT ON Google Play" button featuring the Google Play logo.

DARK WEB

THE PARADOXICAL HOME FOR FREE SPEECH



Basil Jiji

The Global landscape for internet censorship is evolving; countries are increasingly regulating and monitoring online traffic that traverses networks located within their borders. Mainstream social media platforms and big news outlets are beginning to launch their own Tor websites to circumvent governments around the world that use technical and legal strategies to regulate online content. Tor is an anonymity network that hides your identity as you browse the web, share content, and engage online. So far, the BBC, ProPublica, Facebook, the Guardian, and the New Yorker have all launched sites to protect users privacy while seeking to read the news or report information. These sites are hosted on a separate server from the main surface website, and take measures including not tracking cookies, taking no logs, and being available to anyone that wishes to use the site. However, the move is aimed at making the news available to audiences who live in countries where media is blocked or restricted such as China, Iran, and Vietnam, where the BBC is restricted.

The dark web is a small, hard-to-access portion of the deep web. The only way to access the dark web is by using special browsers like Tor and, often, a password. The dark web is generally anonymous, which makes it a shelter for cybercriminals and political protestors. It has remained largely unregulated by the government, and the first step in better monitoring and policing the dark web is better understanding it. The dark web, or darknet, is very often confused with the deep web, but the distinction between the two is very important. The dark web is a specific portion of the deep web and there are a few distinguishing characteristics that a site must meet to be considered a dark website.

There are important uses for hidden services, like Tor, such as when human rights activists use them to access Facebook or to blog anonymously. However, Tor is a tool that can also be used anonymously



for criminal purposes. While it is essential to acknowledge the important role that anonymity plays in protecting human rights activists from oppressive regimes, it is also important to consider the challenges that anonymity poses to the law enforcement community.

Internet censorship is the control or suppression of what can be accessed, published, or viewed on the internet. Regulators may engage in Internet censorship or individuals and organizations may engage in self-censorship due to moral reasons, religion, business purposes, societal norms, intimidation, or fear of legal or other consequences. The extent of internet censorship varies on a country-to-country basis. While most democratic countries have moderate internet censorship, other countries go as far as to limit the access of information such as news and suppress discussion among citizens. Internet censorship also occurs in response to or in anticipation of events such as elections, protests, and riots. But supporters of Internet freedom are trying to overcome such barriers and filters. While many governments point to the reinforcement of social and cultural norms as a basis for conducting filtering, political opposition to the ruling government is the more palpable motive.

The 2017 blocking of Wikipedia in Turkey is one example in which the Turkish Information and Communications Technologies Authority explicitly mentions the use of Hypertext Transfer Protocol Secure (HTTPS) as the basis for the blocking decision. HTTP is the underlying protocol that defines how messages are formatted and transmitted; HTTPS allows for secure communication over a computer network. Many websites and social media platforms have moved from HTTP to HTTPS, which prevents centralized censors from identifying which pages users visit. Political disputes and conflict are more frequently triggering an increase in state-to-state censorship. Several journalists and editors have found themselves detained, imprisoned, or deported because of the information they shared online. Many regimes use content removal to create a structure of internet censorship, forcing people to comply or face jail time or worse if they refuse to do so. Governments often use censorship for political purposes if there is a lack of information sharing in society, then it is easier to manipulate outcomes. In order to circumvent these barriers, journalists and news outlets have begun to normalize the use of the dark web to reach populations traditionally barred from knowing the truth. This solidifies the idea that the dark web is indeed going commercial.



In some countries, governments wish to have complete control of the traffic on the internet. They see freedom of speech as a threat to their power and the dark web as a tool that enables dissidents to speak freely. Most countries try to take a common-sense approach to the idea of censorship. Protecting a person's identity when needed, stopping exploitation, and preventing people from coming to harm are the top priorities. Online anonymity is a double-edged sword that must be treated carefully. As policymakers move ahead, they must monitor vigilantly the evolution of the dark web and ensure that enforcement agencies have the resources and legal support to police successfully. Dark web policy must be nuanced and thorough in order to strike the balance between the needs of privacy-minded users and the government's obligation to stop illegal activity.

FROM WORDS TO WISDOM: GOOGLE BARD A GAMECHANGER?



Varsha J

Bard is Google's experimental, conversational, AI chat service. It is meant to function similarly to ChatGPT, with the biggest difference being that Google's service will pull from all its information from the web. The search giant Google confirmed it will soon start public testing for Bard, based on the company's Language Model for Dialogue Application or LaMDA. In a blog post, Alphabet and Google CEO Sundar Pichai also spoke about how AI-based features would be coming to Google Search as well. It should be noted that so far LaMDA was available in limited testing to select users of the company's AI Test Kitchen app. Bard is based on LaMDA and Google's own conversational AI chatbot. It is what Pichai termed an "experimental conversational AI service," and Google will be opening it up to trusted testers ahead of making it more widely available to the public in the coming weeks.

According to the blog post, Bard "draws on information from the web to provide fresh, high-quality responses." In short, it will give in-depth, conversational and essay-style answers just like ChatGPT does right now. A user will be able to ask Bard "to explain new discoveries from NASA's James Webb Space Telescope to a 9-year-old, or learn more about the best strikers in football right now, and then get drills to build your skills," according to the blog post. However, Google has also said that the model is currently a "lightweight" version of LaMDA, and the one being "requires significantly less computing power, enabling us to scale to more users, allowing for more feedback." Remember that running these models requires a significant amount of computing power. ChatGPT, for example, is powered by Microsoft's Azure Cloud services. This also explains why the service frequently encounters errors due to a high volume of users.

Bard is also based on Transformer technology, which powers ChatGPT and other AI bots. Google pioneered transformer technology, which was made open-source in 2017. Transformer technology is a neural network architecture, which is capable of making predictions based on inputs and is primarily used in natural language processing and computer vision technology. Previously, a Google engineer claimed LaMDA was a 'sentient' being with consciousness. The engineer, Blake Lemoine Google later fired the engineer. Still, Google has also showcased several capabilities of LaMDA last year, including a new project called Wordcraft which was being used to help write fiction. Last September, Google revealed that it "teamed up with professional writers who used the Wordcraft editor to create a volume of short stories. These stories are available online for reading. But Google had also cautioned that LaMDA was not very good at writing fiction by itself and right now was more of a helper to human writers.



"Redefining the limits of AI language"



Google might have invented the 'Transformer' technology, but it is now being seen as a latecomer to the AI revolution. ChatGPT in many ways is being called the end of Google Search, given that conversational AI can give long, essay style and sometimes elegant answers to a user's queries. Of course, not all of these are correct, but then AI is capable of correcting itself as well and learning from mistakes. For Google, whose core business is search, this has resulted in a 'code red' at the company as New York Times reported. According to another New York Times report, Google executives summoned founders Larry Page and Sergey Brin to review AI plans. The founders have mostly stayed out of Google's day-to-day operations, but something has clearly set off alarm bells at the company. It is also clear that many people believe ChatGPT is superior right now, and the onus is now on Google to demonstrate that LaMDA and Bard are actually ahead and can do better. It doesn't help that Microsoft has made significant investments in OpenAI and intends to offer ChatGPT to enterprise customers as part of the Azure Cloud services. As a result, the Microsoft-OpenAI threat comes from multiple directions for Google.

Generative AI will undoubtedly impact the public perception and use of search, and the implications for publishers, marketers and advertisers are broad. Google's Bard, when it is ready, will also change SEO (Search Engine Optimization) practices more than previous search algorithm updates, forcing content creators to focus on creating informative content that answers more complex or detailed questions. Bard also raises questions concerning attribution, and the impact it will have on website traffic, because if it can effectively summarize a complete answer to a query, users will have no need to click on to the website that the information was derived from. What this means is that when searching for information on Google in the future, one can expect chunks and nuggets of information, likely sourced from blogs or articles.



Ranjitha Menon

PROTEUS EFFECT

USER-AVATAR INTERACTION IN VIDEO GAMES

Videogames have become an increasingly popular form of entertainment leading to the multi-billion-pound industry seen today. The mechanics of videogames can vary significantly, and may require little more than pressing a specific button at the correct time to sweeping narrative-driven epics in vast and dynamic game worlds. Although not universal, a common and often integral component found in videogames is the avatar. An avatar is a visual representation of a character that the gamer uses to navigate and interact with in a virtual world through which gamers are able to seek out and achieve in-game objectives. Avatars can often be highly customized characters whose visual design and in-game behaviour are controlled by the gamers themselves.

"The Proteus effect describes a phenomenon in which the behaviour of an individual, within virtual worlds, is changed by the characteristics of their avatar."

The term 'Proteus effect' is derived from the mythological Greek god Proteus who had the power of metamorphosis and was able to alter himself to any shape or form he desired in order to avoid showing his knowledge of past, present, and future events. More specifically, in the context of virtual avatars, the PE refers to the phenomenon where the player-observed features of virtual avatars can influence the in-game behavior or attitudes of gamers. The Proteus effect is the tendency for people to be affected by their digital representations, such as avatars, dating site profiles and social networking personas. Typically, people's behavior shifts in accordance with their digital representatives. We may want to consider some mitigations we have for this in the real world - for example, to ensure equal opportunities in UK schools, the concept of a uniform was introduced as far back as 1552 to ensure that students were treated equally and ready to learn. Possibly we'll see the introduction of uniforms across the metaverse to help foster a similar ethos, especially in circumstances where the fair treatment of avatars has some special importance. We may also start to see attitudes developing towards social acceptability of avatar customizations in certain situations and locations. For example, I recently attended a career fair in Decentraland and did feel a little discomfort at being in a professional virtual setting in a glitter ball suit and neon glowsticks! We may start to see dress codes at events and in specific locations to help attendees adopt the desired mindset of the time and place. Some metaverse may limit the avatar customisation to reduce the creative options for users and try to implement avatar equality.

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There is a clear benefit that avatar customisation could bring in terms of self-expression, the ability to unleash your identity, creativity, the possibility for avatars to be designed to connect on a deeper level to their audience and the opportunity this creates for more diversity and inclusion in avatars which could possibly translate to lived-virtual experience and greater empathy and understanding. When thinking about the Proteus effect, a shy person could utilise a taller avatar in order to try to embrace a more confident digital persona, or someone with body insecurities could alter their avatar to a form which they feel more comfortable with. In addition the observed physical characteristics of an avatar in terms of weight were also identified as affecting individuals during gameplay in several key ways. This included activity during gameplay, healthier food choices in-game and reduced social physique anxiety. Taken together, these studies all appear to indicate that during gameplay, individuals experience a substantial degree of avatar embodiment, and this in turn can affect individuals behaviourally and attitudinally. However there's also already concerns that we can see from this; what could it mean for cultural appropriation as people 'take on' avatar forms outside their real world identity, will real world beauty standards permeate into the metaverse and push avatars to digitally confirm or risk being shunned, will some people feel forced to hide their true identity in their avatar due to how certain characteristics are received IRL and what will this do to their sense of identity and self-worth in the real world?

When thinking about how your avatar may impact your real world behaviours, could violent in-game avatar behaviour translate into the real world and could the ease in which you can change your appearance lead to an enhanced "keyboard warrior" effect where the individual feels disjoined from their actions since they can easily hide behind a new identity? In addition, does the exclusive and expensive nature of many wearables mean that those who can't afford them feel lower self-worth in the metaverse and are treated as less important by others virtually around them? Could this lead to a class system within the metaverse based on what wearables you can afford to equip your avatar with or how you customise it? As we begin to expand our digital personas and spend more time as avatars, the questions of avatar design and treatment are going to become even more important and complex.

It's clear that there are both benefits and drawbacks with the infinite customisation of avatars but as I have outlined above, we must be careful not to just replicate how we treat each other and behave in the real world - but instead think carefully about how we can promote diversity, inclusion and equality within the digital space, as well as embracing the creative opportunities digital representations of us can bring.

CRUNCHING THE NUMBERS

MANTRA BEHIND APPLE'S SUCCESS



Sneha
Vijayan

Have you ever wondered why Apple is so much more successful than other companies? We can clearly say that this success is not a coincidence, and we know that all companies want to be a successful company like Apple. Have you ever thought about how you can be a successful company like Apple?

Apple was founded in April 01, 1976 by Steve Jobs, Ronald Wayne and Steve Wozniak in Cupertino, California, USA. Steve Jobs is the father of the Apple Company. Steve Jobs is a curious entrepreneur who left school and wondered what was going on in the technology zone and watched what technology companies were doing, and he hardly had any technical knowledge. Steve Jobs has a character that communicates easily with entrepreneurs and people and has a stubborn nature behind his ideas. Another feature of Steve Jobs is a perfectionist structure. In these characteristics Steve Jobs is described as a human having a very compelling character. Steve Jobs's never-ending research spirit and entrepreneurial structure; it made him meet new people. One of the most important of these people is Steve Wozniak, who founded Apple. Wozniak is a technically gifted computer genius and makes computer boards by himself. Discovering this talent at Wozniak, Steve Jobs decided to convince Wozniak to make computers, and together they made the first Apple 1 desktop computer in that famous garage and began selling it. These end-user computers are almost a first in the history of the world, and the success of Apple's emergence and growth. The main reason Apple and Steve Jobs succeeded is that the company strategy is based on the basic principles. Just like Coca Cola's formula, Apple has a secret formula.



Let's look at the Apple's secret formula. Success is not a self-evolving factor, you must implement all processes and stand behind your products, as Apple does. Steve Jobs, when creating Apple has found a triple gold ratio and has applied this gold ratio to Apple. Apple's core philosophy and formula for success have combined technology with simplicity, creativity and design, and found a successful formula. As you know, when we say technology, we always think of complex electronic devices, and when we think of 1976, it was very difficult to use, and Steve Jobs' dream was to combine simplicity, creativity and design to create a computer that people would use very easily. Steve Jobs, Apple 1 computer has implemented all these things and this computer Mouse, Keyboard, the first computer used to have the feature. All Steve Jobs wanted was a very simple computer; Steve Jobs was focused on the fact that the computers used in university laboratories at that time were too large and did not allow a standard person or office to use them. Steve Jobs actually saw a problem as a good entrepreneur and set out to find a solution to this problem. Apple entered the market in 2007 with the iPhone with a touch-screen phone, and in the same way, Apple revolutionized beyond its era. He thinks beyond the age of the company and you should think beyond the age in your company.

What is the most important thing that attracts your attention when you buy an Apple product? Or what is the most important detail you notice when you visit an Apple store? Design. Not Just Design. Simple Design. Easy to understand design. Elite Design. When you go to an Apple store, you will find a store design that goes beyond its age. When you buy an Apple product, you'll see a box design with a great design when you open it. When you open the box, you can see that the contents of the box are beautifully designed and that all the gaps are perfectly calculated to produce the box and the product. This process has been going on since Steve Jobs founded Apple. This is Steve Jobs's biggest obsession or formula. It's a very well-designed product, a simple, all-in-one, and it's important for Steve Jobs to be beyond the age of this product.

Steve Jobs's search of himself for a while in his life and his search for himself in India and the philosophy of simplicity there. Apple's success is also due to the high quality of its products. When you pick up an iPhone, we don't even have to tell you how good the product is. The phone gives you this feeling automatically. With these quality products, Apple has become a Love Mark brand. The products produced by the company are so high quality that even though they sell millions of products in the world. Another key feature of Apple is that it constantly innovates. Apple renews its products every year and develops all products with an understanding beyond the era.



People criticize the last series of apples phones with lack of innovation. But no one realise that the actual innovation is happening on their silicon chips. If you have an iPad, an iPhone and an Apple Watch, and you can synchronize your accounts on these devices simultaneously; you can communicate with each other and use all features from the same device and back up all your devices simultaneously. It should not be forgotten that

Apple was installed in a garage and went through many stages until it reached these points. The first Apple product was far from the current computers. When they first thought about the Apple iPhone, it wasn't the most perfect phone of its era, and in time, the product was constantly developed with a perfectionist philosophy. It took more than 35 years for the company to reach these points and hundreds of thousands of people worked and carried the company to these points. Steve Jobs had a philosophy; and the company was raised by people with this philosophy, and the company took over.



AI TAKING OUR JOBS?

A Deep Look into Massive Layoffs



Sandeep K

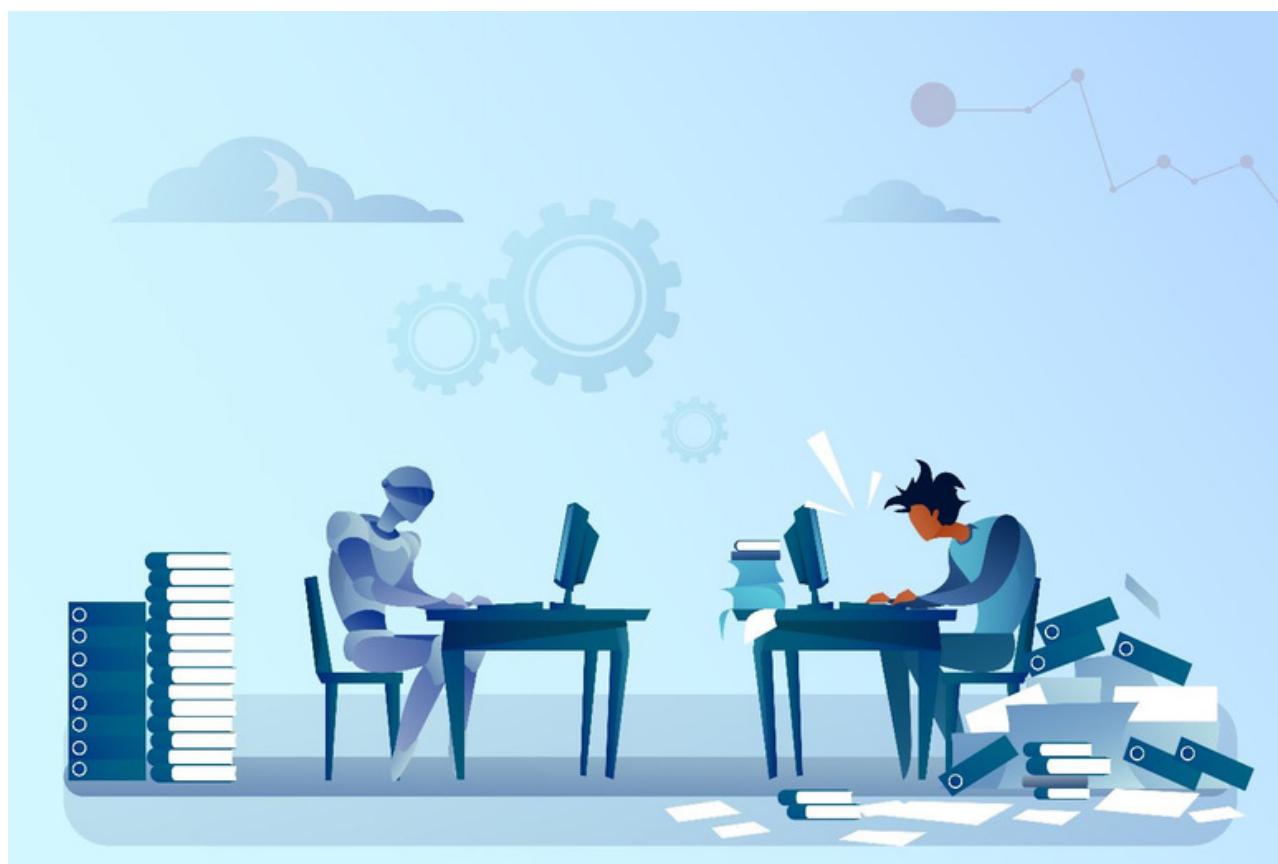
The world's biggest tech companies have collectively laid off more than 150,000 workers in recent months. The businesses involved have put forward a variety of reasons for why this was necessary, which mostly come down to a need to reduce costs as economic growth slows down around the world.

In truth, it isn't likely to be because the companies involved need money. Microsoft which is reported to have laid off around 10,000 employees, practically simultaneously announced that it plans to invest \$10 billion in OpenAI, the creators of the viral application ChatGPT. It seems likely that there is a business reason at the heart of the decision to invest a sum that would equate to \$1 million per laid-off employee in an AI company. Likewise, Google's parent company Alphabet announced plans to reduce its global headcount by 12,000 a cut of around 6%. CEO Sundar Pichai has previously described AI as the most transformational technology of all time, and in making the layoffs, stated that the strategy will be to "direct our talent and capital to our highest priorities." It's widely thought that Google is working on its own AI-powered answer to ChatGPT that will be announced soon. Together, four of the biggest tech companies Meta, Alphabet, Amazon, and Microsoft have cut 50,000 jobs. Meanwhile, Twitter's incoming new boss, Elon Musk, is said to have fired half of the company's employees when he took over at the end of last year. So, what is the true reason for these mass cuts that have left tens of thousands out of work? This was what data experts at 365 Data Science attempted to get to the bottom of when they decided to run their own analysis of the figures.

Some of the findings were perhaps not that surprising. It's known that tech companies buoyed by record revenues undertook a hiring spree during the Covid-19 pandemic. Salaries hit record levels as competition raged for the top talent, and the media was full of stories of lavish perks. So, it's not a shock to find that the median time a recently laid-off employee has been in their role is roughly two years. This could suggest that, in some ways, these cuts represent a winding-back of hiring policies put in place since the pandemic. More surprising though, was the fact that the median level of experience held by those who were let go is 11.5 years. So, it's not necessarily true that these are all junior workers with little experience who could be quickly replaced or possibly even have their roles automated. One possible reason for this statistic could be that longer-serving employees tend to receive higher salaries, and cutting them could help businesses meet their financial targets.

However, it is interesting to note that the roles and job functions most affected were within HR, which accounted for 28 percent of all layoffs. There are two possible reasons for this firstly, it follows that if companies are laying off staff, they will also be cutting back on recruitment, and less recruitment means less need for HR staff. A second, though perhaps just as relevant reason, however, is that HR is an area where some functions are being replaced by automation. Platforms already exist that aim to automate routine tasks related to interviewing and onboarding new hires, such as checking references, verifying identities, and carrying out health and safety assessments. In recent years, it's even been reported that companies such as Amazon have used AI to identify low-performing staff and then fire them. We also get some insight into how the roles that were affected differed between each company. While HR and talent sourcing were most affected at Microsoft and Meta, at Google and Twitter, it was software engineers who took the brunt of the cuts. The data collected by 365 Data Science also shows that a narrow majority of the staff who were let go (56 percent) were female. This is worrying, given that the tech industry has spent much of the last decade attempting to address the gender imbalance already present within the field particularly within technical and engineering roles. It doesn't exactly send out a great message to potential new female hires that, as well as a pay gap and a lower likelihood of progressing into senior roles, they will have to content with a greater chance of being let go.

So, is it the case that the tech giants simply expanded too far, too quickly? Or is it that innovations in AI and automation have created a situation where the fastest way to save money is to replace people with machines? In truth, it's likely to be a little of both. None of the companies have specified automation as a driving force behind the moves, but given the job roles affected and reading between the lines, it's tempting to draw the conclusion that it is a contributing factor.



THE DARK SIDE OF DEEPFAKE TECHNOLOGY

Incriminating audio and video will hold even less weight than it already does. A government doesn't have to lie to its people or censor its enemies when no one believes a thing to begin with.

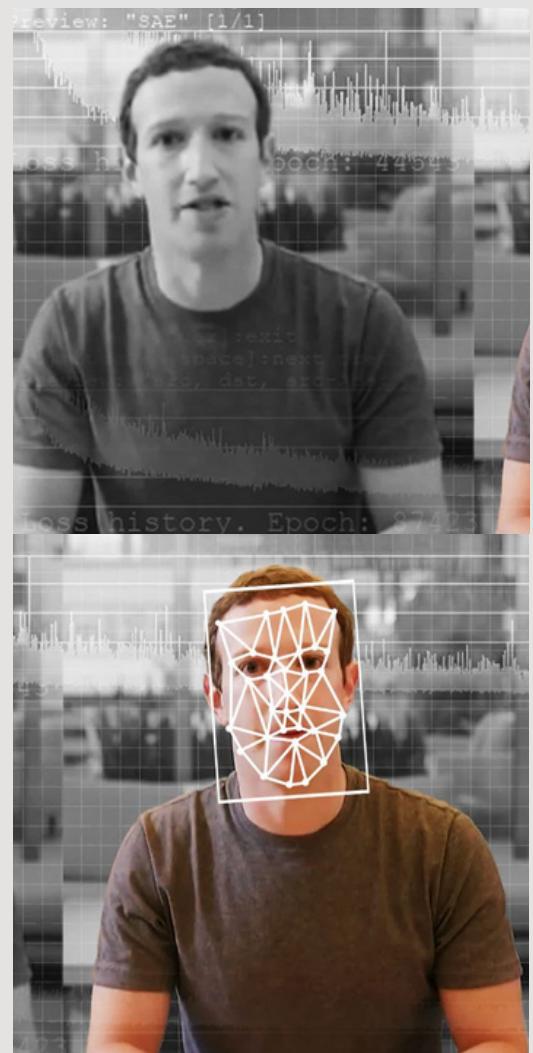
The dark side of AI is exemplified by Deepfake technology, which uses advanced machine learning algorithms to create convincing fake videos and audio. While deepfakes can be used for harmless fun or entertainment, they have also raised concerns about their potential use in spreading misinformation, disinformation, or propaganda. The technology could be used to create fake news, manipulate political campaigns, or even defame individuals by making them appear to say or do things they did not. As such, it is important to be aware of the risks posed by deepfakes and take steps to address them.

High-profile figures make for such perfect sources in deepfaking because their public profiles provide plenty of source material for an AI to learn from, but with the number of selfies the average person takes in a lifetime and rapid technological advances, perhaps soon anyone could be used as a source. . Therefore, it is important to take steps to address the risks posed by deepfakes. This includes investing in technologies that can detect and prevent deepfakes, educating the public about the risks of deepfakes, and developing regulations and laws that can address the malicious use of deepfakes. By doing so, we can help ensure that deepfakes are not used to do harm and that the benefits of AI are harnessed for the greater good. One of the most scarily convincing deepfakes is this Morgan Freeman deepfake. The video was first shared by Dutch deepfake YouTube Channel Diep Nep, crediting the concept to Bob de Jong and the voice acting to Boet Schouwink. The video's still hugely impressive, and frightening, a year on, as we saw when it resurfaced on Twitter. Another example. Popular deepfake creator Shamook took the Spider-man: No Way Home trailer and replaced Tom Holland's face with the original spidey, Tobey Maguire. It's a subtle effect, but executed brilliantly so you can barely tell there's been a change at all. This kind of edit makes us wonder what the future of film could look like using this technology. Imagine being able to choose your preferred actor to play the lead in the film you're watching.

With fears growing that convincing deepfakes could be used for criminal purposes or to trick whole populations, a lot of people are inevitably wondering how deepfakes can be spotted. There are organisations that work to validate the authenticity of videos and images shared online using various techniques, but if you ever find yourself on a video call with someone who you suspect might not be real, one good idea is to ask the person to turn to the side.



Sanmanul
Faris A



This works because the software used to estimate facial poses for deepfake videos doesn't do too well at acute angles and assign more landmarks to the front of a face than they do to the side. In most cases, there are fewer images of people in profile too, meaning they have fewer example images to learn from.



The Defense Advanced Research Projects Agency (DARPA) is an agency of the United States Department of Defense responsible for the development of emerging technologies for national security. One of its primary goals is to develop advanced technologies to detect and counter disinformation and propaganda, including deepfakes. DARPA has invested significant resources in this area, and it has funded several research programs aimed at developing advanced deepfake detection technologies.

A tool named "Photoguard" has been created by a team of researchers at the Massachusetts Institute of Technology (MIT) under the direction of computer professor Aleksander Madry that prevents AI from convincingly manipulating a person's images. The research team demonstrated how Photoguard can "immunize" images against AI alterations in a paper that was released earlier. In order to introduce undetectable noise into an image, the program uses data poisoning techniques to disrupt the pixels within a picture. As a result, AI art generators are effectively unable to produce convincing deep fakes using the photographs that it has been fed and trained on.



This is particularly important nowadays because the tools for making deepfakes are becoming more accessible, and social media sites will easily allow people to distribute and share such fake contents. Although deep learning has shown a remarkable performance in deepfakes detection, the quality of deepfake has been increasing. Hence, the current deep learning methods need to improve as well to successfully identify fake videos and images.



Dhanush U

A FUTURISTIC RETAIL EXPERIENCE

Amazon Go is a chain of convenience stores that offer a unique shopping experience. These stores operate without checkout lines or cashiers. The technology behind Amazon Go is complex and sophisticated. The stores are equipped with a variety of sensors, cameras, and machine learning algorithms that work together to track customer movements and purchases. When a customer enters the store, they scan a QR code on their phone that links to their Amazon account. As they move through the store, cameras and sensors track the items they pick up and add them to their virtual shopping cart. If a customer puts an item back on the shelf, it is removed from their cart. When they leave the store, their Amazon account is automatically charged for the items they took. But how does the system recognize in the store which products a customer takes? Amazon itself is happy using nebulous buzzwords, talking about computer vision and deep learning, and merely lets you know that technologies are being used that are similar to self-driving cars. Amazon coined the name Sensor Fusion for the number of their technologies in use. Cameras and a combination of different sensors provide a learning algorithm that is supposed to recognize which products customers take off the shelf and perhaps put back again. Amazon is likely to rely on a technology similar to face recognition that recognizes objects from a variety of angles and uses models such as RFID to determine the respective position of customer and product. Sensors can also be used to detect the weight of the products on the shelf or even the weight or size of the customer. There are reports that in the past the tracking system would get confused when there were two people of similar body shape and stature. Sometimes kids and occasionally adults would take items from one shelf and put them back on an incorrect shelf. This also caused problems with the Sensor Fusion technology, since it couldn't understand when the item on the incorrect shelf was later removed by another customer.

The first Amazon Go store opened in Seattle, Washington in January 2018, and the company has since expanded to several other locations across the United States. The concept has been well-received by customers, who appreciate the convenience and efficiency of the shopping experience. However, the technology behind the stores has raised some concerns about privacy and job displacement. One of the main advantages of Amazon Go is the convenience it offers. Customers can quickly grab what they need and leave without having to wait in line to check out. This saves time and eliminates the frustration of dealing with slow-moving checkout lines. The store is also open 24 hours a day, 7 days a week, making it a convenient option for people who need to shop outside of regular business hours.



While the technology behind Amazon Go is impressive, it has also raised some concerns about privacy. Some people are uncomfortable with the idea of being constantly monitored by cameras and sensors while they shop. There are also concerns about the potential for data breaches or other security issues. Amazon has responded to these concerns by emphasizing the security measures in place to protect customer data and privacy. Another potential issue with Amazon Go is job displacement. By eliminating checkout lines and cashiers, the stores could potentially put thousands of people out of work. However, Amazon has argued that the stores create new jobs in areas such as maintenance, stocking, and customer service. Additionally, the company has said that the stores are intended to complement traditional retail stores, not replace them entirely.

Overall, Amazon Go represents an innovative and exciting development in the retail industry. The stores offer a unique shopping experience that is more convenient and efficient than traditional retail stores. However, the technology behind the stores also raises important questions about privacy and job displacement. As the concept continues to expand, it will be important to carefully consider these issues and ensure that the benefits of the technology are balanced with the needs and concerns of consumers and workers.

THE EPIC BATTLE:

ALPHAGO VS LEE SEDOL - A MILESTONE IN AI DEVELOPMENT



Shamna S

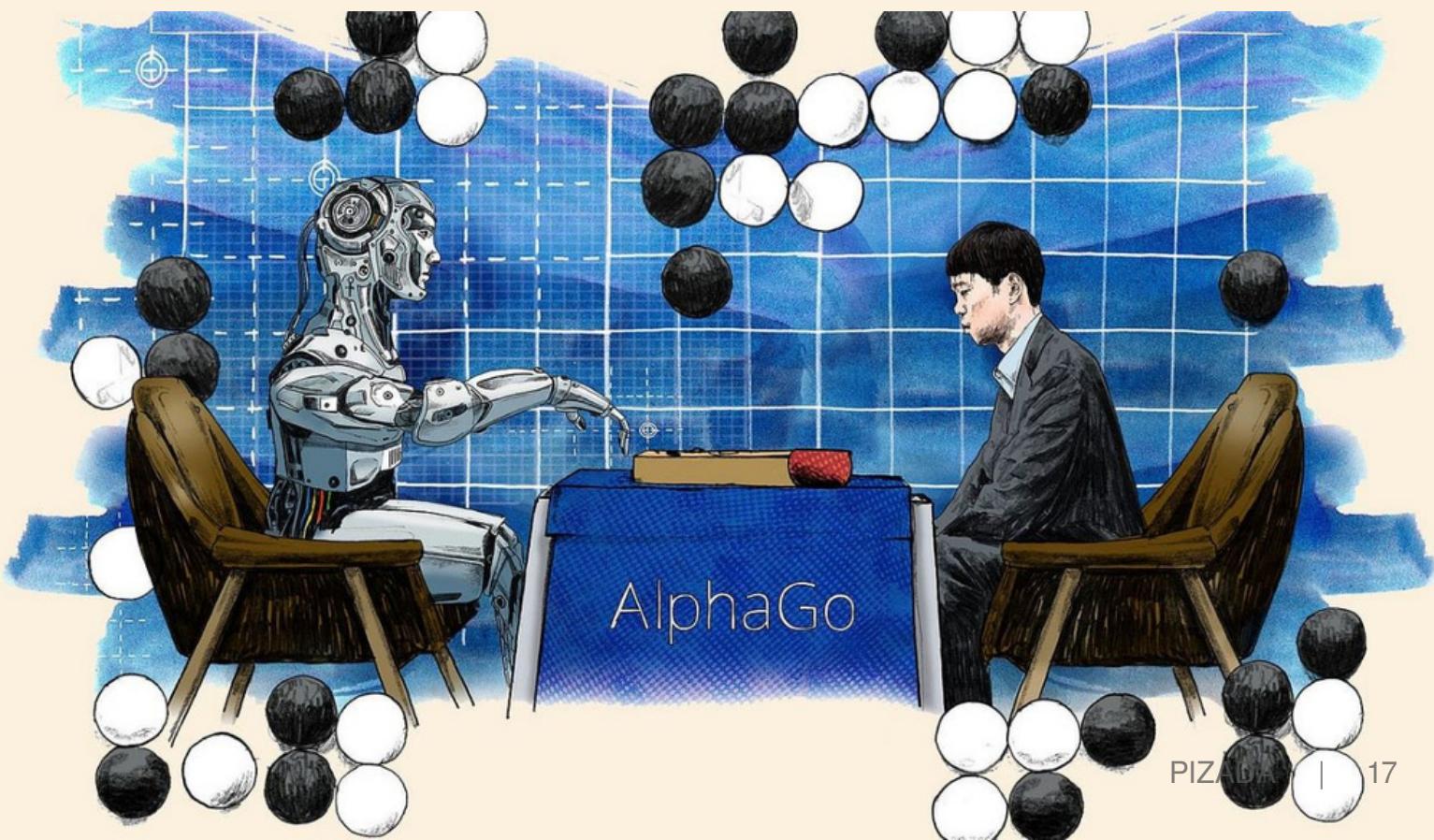


Akshara KS

In March 2016, the world was captivated by the historic match between AlphaGo, an artificial intelligence (AI) program developed by Google's DeepMind, and Lee Sedol, one of the greatest Go players of all time. The five-game match, held in Seoul, South Korea, was seen as a test of the potential of AI to challenge and surpass human intelligence.

Go is a complex board game that originated in China more than 2,500 years ago. It is played on a 19x19 board with black and white stones, and the objective is to capture more territory than your opponent. Unlike chess, which has a finite number of possible moves, Go has more possible board configurations than there are atoms in the universe, making it an incredibly complex game to master.

AlphaGo had already made waves in the Go community by defeating the reigning European champion Fan Hui in a 5-0 sweep. But Lee Sedol was a much tougher opponent. He had won 18 world titles and was widely considered to be one of the best Go players in history.



The first game of the match was held on March 9, 2016. Lee Sedol, playing as black, made a surprising move early in the game that seemed to catch AlphaGo off guard. The AI program took an unusually long time to make its next move, suggesting that it was struggling to adapt to Lee Sedol's strategy. But as the game progressed, AlphaGo started to play with more confidence and ultimately won by 1.5 points, a narrow margin in Go. The second game, held on March 10, was even more impressive for AlphaGo. Lee Sedol played a strong opening, but AlphaGo responded with a series of moves that were so unconventional that they seemed almost reckless. However, as the game progressed, it became clear that AlphaGo had a deeper understanding of the game than anyone had previously realized. The program won by resignation after just 176 moves, stunning the Go community and the world at large. Lee Sedol won the third game, but AlphaGo bounced back to win the fourth game and take an insurmountable 3-1 lead in the match. The fifth and final game, held on March 15, was largely seen as a formality, as AlphaGo had already clinched the victory. But Lee Sedol played with renewed energy and won a hard-fought victory, becoming the only human to defeat AlphaGo in a match.



At its core, AlphaGo uses a combination of advanced algorithms and machine learning techniques to analyze the game of Go and develop its own strategies. This involves two main components: a deep neural network that evaluates game positions, and a Monte Carlo tree search algorithm that generates possible moves. The neural network is trained on a dataset of more than 30 million moves from professional games, using a technique known as supervised learning. This involves feeding the network a series of board positions and moves, and then adjusting the weights of the network to minimize the

difference between its predictions and the actual outcomes of those games. Over time, the network learns to recognize patterns and evaluate the strength of different moves based on their context. The Monte Carlo tree search algorithm, on the other hand, uses a simulation-based approach to generate and evaluate possible moves. It starts with the current board position and gradually builds a tree of possible future moves, exploring each branch in turn and evaluating the expected outcome of each one. This involves simulating many thousands of possible games, using the neural network to evaluate each move along the way. By gradually refining its search based on the results of these simulations, the algorithm is able to find the best possible move given the current board position.

One of the key innovations that enabled AlphaGo's success was the use of "reinforcement learning" to train the neural network. Unlike supervised learning, which involves feeding the network pre-labeled training data, reinforcement learning involves having the network play many games against itself and learning from its mistakes. This involves tweaking the network's weights based on the outcomes of these self-play games, gradually improving its ability to evaluate different game positions and generate more effective moves. Another important factor in AlphaGo's success was its ability to learn from human players. In addition to training on the massive dataset of professional games, AlphaGo also played many games against human opponents, learning from their strategies and adapting its own approach accordingly.

The AlphaGo project demonstrated the potential of machine learning and AI to tackle complex problems that were previously thought to be the exclusive domain of human intelligence. It also raised questions about the future of human labor and the potential risks of creating machines that are smarter than we are. Ultimately, the AlphaGo project was a reminder that as we continue to push the boundaries of AI, we must also grapple with the ethical and societal implications of this powerful technology. A detailed documentary Alpha go vs Lee Sedol is available on DeepMind youtube channel entitled "AlphaGo - The Movie Full award-winning documentary"



Anoop BK

AVATAR

The Cutting-Edge Technologies That Brought Pandora to Life

Released in 2009, the sci-fi epic "Avatar" set a high benchmark for digitally rendered visual media as director James Cameron introduced the vibrant alien world of Pandora to the audience with a unique amalgamation of 3D, motion capture, and a virtual stage. There were instances where the technologies had been used earlier to great effect, in movies like "King Kong" and "Pirates of the Caribbean," to name a few, but the way Cameron pioneered their upgrade, adding his own innovations, was unprecedented. To project his vision onto the silver screen in "Avatar," Cameron invented filming techniques and equipment such as performance capture using head rigs, a virtual stage called "volume," fusion cam, and virtual cam, which all together contributed to an extremely immersive experience for the audience. For the next chapter of the Avatar franchise, Cameron upped the ante by choosing to move the setting to the ocean and sub-marine locations, an extremely challenging hurdle, especially when motion capture is involved. However, unsurprisingly, Cameron managed to outperform himself this time as well, as "Avatar: The Way of Water" has left the audience flabbergasted with its palpable underwater scenes, so much so that at times it felt like a zoological documentary.

"Avatar 2" is one of a series of mega-budgeted franchise movies that deals with extensive underwater sequences. "Aquaman" and "Black Panther: Wakanda Forever" were two movies released recently that depict the sub-marine world with their own distinctiveness.





"Avatar 2" was unique in the sense that it had the arduous task of using motion capture in underwater scenes, and the director had good reason to back up such a decision.

An underwater camera rig was built from a 3D beam splitter known as DeepX3D, which was invented by Australian cinematographer Pawel Achtel in 2015. Cameron sought Pawel's consultation and utilized this rig to capture shots underwater, as this rig was the only viable option to achieve stereoscopic 3D image clarity in underwater sequences. Nikon's 15mm lenses from the 1980s were used as "glass," which are old lenses specially developed by Nikon for underwater photography. Using these two, the underwater scenes achieved clear, distortionless IMAX3D brilliance. Another advantage of using the DeepX3D rig was that it was relatively easier to use than even conventional camera systems, as it weighed only around 30 kg. In order to shoot underwater, a 900,000-gallon tank was used in the studio, and all the actors had to learn free diving and breathe control. Kate Winslet, who plays Ronal in the sequel film, reunited with Cameron after "Titanic." Two Sony F950 stereoscopic cameras were combined to create a fusion camera rig for

"Avatar" (2009), which was a unique invention as it allowed a free range of motion for the director on the virtual stage. For the sequel, Cameron upgraded the rig by adding Sony Venice cameras, the company's (Sony) first full-frame digital camera, which was specially made to meet the movie's demand. The camera is capable of capturing images in 6K and also offers a higher dynamic range, making the images even more vibrant, rich, and detailed. The camera can be used by placing only the optical blocks on the rig, which aren't encumbered by the main camera system's weight. These cameras were attached with a 3D stereoscopic standard movie frame rate of 24 fps, Cameron opted to shoot the action scenes of "The Way of Water" at 48 fps. Peter Jackson's visual effects studio, Weta, was extensively associated with the project and had

to oversee much of the post-production effects. Using PhysLight, a cutting-edge global illumination system, was utilized, which simulates one of the most realistic on-set lightings as seen in its previous uses during "The Batman" and "War for the Planet of the Apes." Weta also used a photorealistic facial feature animation technique by growing pores on faces using flow maps. The result was extremely detailed features of Na'vi characters and Pandora's Megafauna. James Cameron's lifelong love for the depths of the ocean and his own documentary-making experience as an explorer made him obsessed enough to seek perfection while showing the world what underwater actually looks like. It can be understood how driven he was when it is revealed that, at some point, they even thought of using motion capture on a whale to track Tulkun's movements. Perhaps his obsession with perfection when it comes to cinematography led him to reinvent underwater cinematography, yet again overcoming a hurdle that he imposed on himself. We will eagerly wait for the upcoming sequels of the franchise to marvel at his genius of revolutionizing digital filmmaking yet again.

EXPLORING INDIA'S DIGITAL RUPEE: A NEW ERA OF CASHLESS TRANSACTIONS



Sreeshna



Jincy

Digital payments have revolutionized the way we transact and India has been at the forefront of this change. In line with the government's vision of a cashless economy, the Reserve Bank of India (RBI) launched the Indian Digital Rupee (IDR) project in 2020.

The IDR is a digital version of the Indian rupee, designed to facilitate seamless and secure digital transactions. In this article, we will discuss the key features of the IDR, its benefits, and its potential impact on the Indian economy. The IDR can be stored in a digital wallet that can be accessed through a mobile app or a web portal. It is designed to be interoperable, which means it can be used across different payment systems and platforms. Transactions in IDR can be completed in real-time, which means that the recipient can receive the funds instantly. The IDR is designed to be secure and tamper-proof. It uses advanced encryption technologies to protect user data and prevent fraud.

RBI has divided the digital rupee into two categories retail (e₹-R) and wholesale. The digital rupee for the wholesale segment was announced on November 1 which is mainly used by banks to settle secondary market transactions in government securities. Meanwhile, the retail version of the digital currency can be accessed by the end users to make daily transactions. The first phase of the retail Digital Rupee pilot project will cover select locations and banks. RBI has also mentioned that during the pilot the digital currency will be available in a closed user group (CUG) which comprises participating customers and merchants. RBI has confirmed that the pilot will initially cover four cities New Delhi, Mumbai, Bengaluru and Bhubaneswar. The controlled launch of the digital currency in these cities will involve four banks State Bank of India, Yes Bank, ICICI Bank and IDFC Bank.

ICICI Bank. Customers and merchants residing in the above-mentioned cities and having their accounts in these banks will be able to use the digital rupee. The central bank has also noted that the service will be subsequently extended to more cities including Hyderabad, Ahmedabad, Guwahati, Lucknow, Indore, Patna, Kochi, Shimla and Gangtok. Four more banks including HDFC Bank, Kotak Mahindra Bank, Union Bank of India and Bank of Baroda will also be added to the pilot soon. RBI has also suggested that the digital rupee pilot will later expand to more banks and locations if everything goes as planned.

The e-rupee will be an electronic version of cash which is expected to be available to all the private sector, non-financial consumers and businesses. This version of the digital currency will be used mainly for retail transactions. Since it will be the direct liability of the central bank, the e-rupee will be able to offer access to safe money for payments and settlement. Digital Rupee will be issued in the same denominations as the available paper currency and coins. RBI will also distribute digital currencies through banks and users will be able to make transactions with the digital tokens via the respective offered by the different participating banks. Users can make both consumer-to-consumer (C2C) transactions as well as consumer-to-business (C2B) transactions with the upcoming digital currency. The QR codes displayed at retail locations can also be used to pay businesses



While introducing the digital rupee, RBI expressed that the e-rupee will be able to reduce the operational costs required for physical cash management. Apart from that, the digital tokens will not only help in fostering financial inclusion but will also bring resilience. Moreover, digital currency is also expected to increase efficiency and innovation in the payments system. RBI has raised repeated concerns related to private cryptocurrencies like Bitcoin, Ether, etc. which include terror financing, tax evasion, money laundering and more. However, CBDCs are designed to bridge the gap between the advantages and risks of digital currency. It is easy for users to transact digitally without the need for physical cash or cards. Digital transactions in IDR are cheaper than traditional modes of payment, such as credit cards and debit cards. The IDR can help promote financial inclusion by providing access to digital payments for people who do not have bank accounts or credit cards. IDR can help boost the Indian economy by promoting digital payments, reducing the cost of transactions, and increasing the efficiency of the financial system.

The Indian Digital Rupee has the potential to transform the Indian economy by promoting digital payments, reducing transaction costs, and promoting financial inclusion. The launch of the IDR is a positive step towards a cashless economy and can help increase the efficiency and transparency of the financial system. However, the success of the IDR will depend on its adoption by consumers and businesses, and the development of a robust ecosystem of digital payments.



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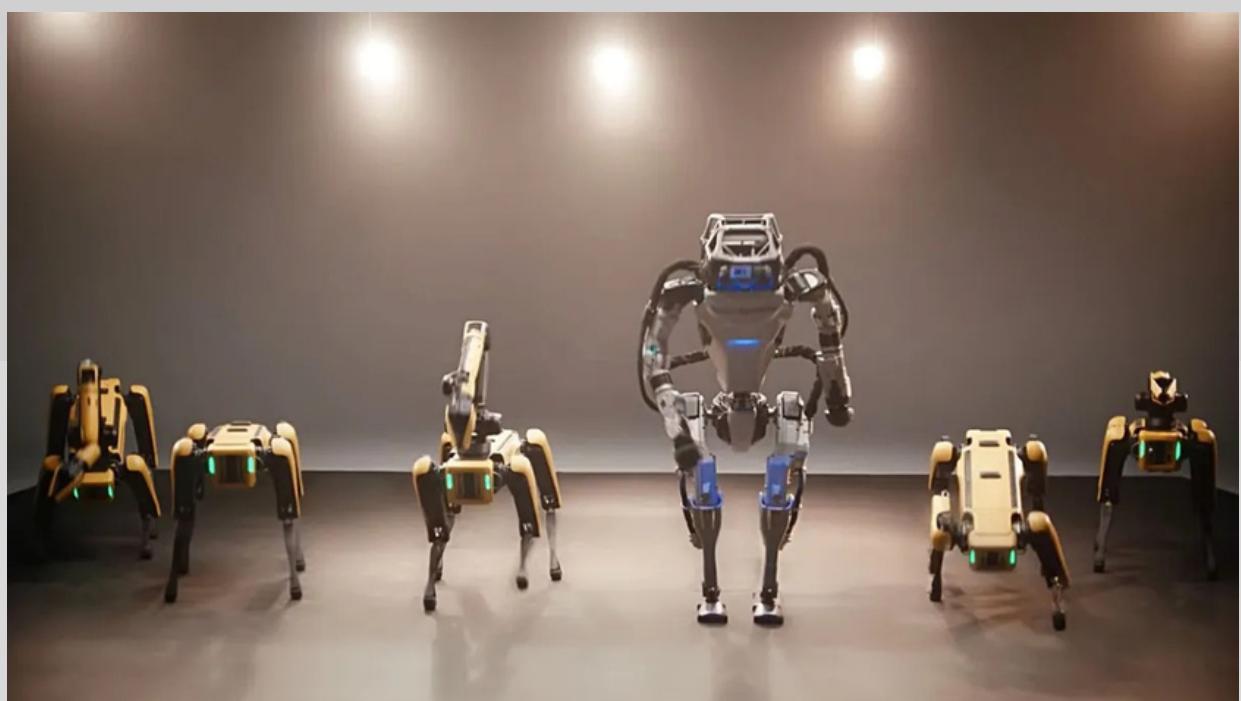


Anupama K

FROM FICTION TO REALITY: THE CUTTING-EDGE ROBOTS OF BOSTON DYNAMICS

Did it ever come to your mind what our future would be? With the continuous rising of tech inventions and innovations, there is no wonder that we are on our way to a future where we see flying cars, advanced drones, and of course, robots. The idea of robots taking over our jobs is quite a stretch. It will obviously affect our economy at all levels

liberating humans from the foremost tedious, monotonous tasks, like walking around warehouses, cleaning office premises, building electronics, and many more. But did you know that there are already existing robots doing those kinds of tasks today?



Not every robotics company can boast legions of fans online, and not many robotics companies make robots quite like Boston Dynamics. Each time their firm shares new footage of its machines, they cause a sensation on the internet, blowing everyone's minds. Whether it's a pack of robot dogs towing a truck or a human-like bot leaping nimbly up a set of boxes, Boston Dynamics bots are uniquely thrilling. Boston Dynamics, an American engineering and robotics design company, was founded by Marc Raibert as a spinoff from the Massachusetts Institute of Technology in 1992. They first worked with the American Systems Corporation under a contract from the Naval Air Warfare Center Training Systems Division to replace naval training videos for aircraft launch. As advances and interest in deep learning began to pick pace, Google X bought the robotics company but later on shut down because they failed in turning it into a profitable business. They then sold Boston Dynamics to a Japanese investment giant, SoftBank, which reported \$165 million in 2017. Therefore, even though changing hands three times in a decade is not a good outlook for any company, the \$1.1 billion valuation shows that Boston Dynamics value has increased, and SoftBank is making a lot of money out of the deal. One of the things that makes them unique is their ambition to build dynamically stable, legged machines.



And, of course, we would not miss Boston Dynamic's very own SPOT. It is the first generation of semi-autonomous, four-legged robots. This robot is probably the most famous and used robot of Boston Dynamics. Spot is an agile, mobile robot that navigates the terrain with unprecedented mobility, allowing you to automate routine inspection tasks and data capture safely, accurately, and frequently. It is designed for developers to explore how flexible mobile robots can be adapted for tasks ranging from industrial inspection to entertainment. Spot comes ready to operate, right out of the box. This robot costs \$74,500 and is being used on many construction sites, soldier's deployment, and more.

Boston Dynamics released their robot named STRETCH designed for warehouse and automation. This robot is not modelled after humans or animals. Instead, it aims to be as practical as possible. It has a square mobile base containing a set of wheels, a "perception mast" with cameras, other sensors, and a giant robotic arm with seven degrees of freedom and a suction pad array on the end that can grab and move boxes up to 23 kilograms in weight. This robot has the ability to unload trucks and load pallets. Stretch's base is small enough to fit anywhere a pallet does. It is still in development, and Boston Dynamics is looking for customers to test it. They aim to release Stretch commercially in 2022 and haven't yet revealed a price tag.

Let's start with the first legged robot that left their lab, the BIGDOG. BigDog is a dynamically stable quadruped military robot created in 2005. It was funded by the Defense Advanced Research Projects Agency in the hopes that it would be able to serve as a robotic pack mule to accompany soldiers in terrain too rough for conventional vehicles. Instead of wheels or treads, BigDog uses four legs for movement, allowing it to move across surfaces that would defeat wheels.

Another robot that has taken a lot of interest was ATLAS. Atlas is considered as the world's most dynamic humanoid robot and Boston Dynamics' biggest celebrity. It is a research platform designed to push the limits of whole-body mobility. Atlas's advanced control system and state-of-the-art hardware give the robot the power and balance to demonstrate human-level agility. This tall humanoid is capable of impressive athletic feats. Its actuators are driven by a compact yet powerful hydraulic system that the company engineered from scratch. The unique system gives the 80-kilogram robot the explosive strength needed to perform acrobatic leaps and flips that don't seem possible for such a large humanoid to do. This robot can jump... run... do somersaults... and can even dance! Atlas has inspired a string of parody videos on YouTube and more than a few jokes about a robot takeover.

THE SOCIAL DILEMMA

UNVEILING THE DARK SIDE OF SOCIAL MEDIA



Anuraj N

When was the last time you checked social media? A few days ago? Last night? Just before reading this article? If you find yourself unable to go more than a few hours without scrolling through Facebook, Instagram or other social medias that's not entirely surprising. According to the Netflix documentary "The Social Dilemma," by Jeff Orlowski, social media's design is meant to foster and nurture an addiction in its users.

Dilemmas of various kinds perennially dot our lives. Relationships, careers, pass-times, pursuits, interactions and even our personal spaces allow us the liberty, and often create the necessity, of having to take decision after decision. Mundane matters – which route to follow to a destination, which menu item to choose, which clothes to wear and which friend to chat with, also provide us with the opportunity to flex our decision-making muscles, so to say.

The Popular Netflix film, The Social Dilemma, highlights the specific quandary that we the people face in today's social media driven time capsule. Privacy issues as well as mental health and specifically addiction related issues have been raised by this film. The documentary highlights the so called terror that we the people



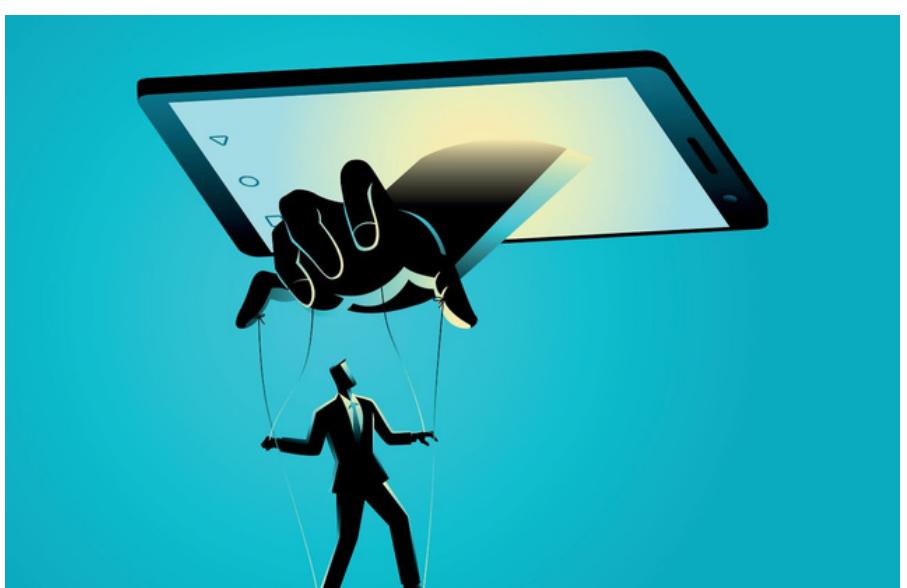
face in today's social media driven time capsule. Privacy issues as well as mental health and specifically addiction related issues have been raised by this film. The documentary highlights the so called terror that users face due to their own browsing habits. The film cautions virtually the whole world to back off in its usage of those social media power houses, Facebook, Instagram, Twitter, and the like. Big Brother is always said to be watching. Our every move, our every choice, is known to these big bad guys, according to The Social Dilemma. This is a film based on damaging video statements given by former employees of Facebook against the social media world. Thus, advertisers are said to be sharks waiting to swoop upon us the moment we click a button. Algorithms which are used by these social media giants are alleged to be designed to extract every fraction of monetary resources that we possess. Political and financial bigwigs are supposed to be bidding their time until we divulge our true nature. One of these harsh realities is that the privacy breaches and addictive designs found on social media platforms are actually features, not bugs, according to the film. But why? What do tech giants like Facebook or Google gain from our addiction to scrolling? The name of the game when creating an algorithm is to get you to stay on a site longer because the longer you stay, the more ads you will see and the more likely you are to purchase something, which in turn, increases these companies revenue.

The Social Dilemma has truly set the cat among the pigeons and deflated the cushy bubble of virtual reality that several people were living in before they viewed the film.

One youngster I know well, and I dare say there are many like him, has actually deleted his beloved social media accounts, so petrified was he by these scary revelations. The film has jolted the millennial in particular. That young person who was born with technology in his palm now discovers that technology can harm him no end. His beloved Instagram, where he virtually lives, is supposedly inhabited by monsters disguised as advertisements, leading links, suggestions etc. which can gobble up his peace and his freedom. The Netflix film has thus rattled and shaken a large number of people across the world. The response of Facebook to these forceful allegations has been to send out a typically pointed denial which virtually scoffs at the main thrust areas of The Social Dilemma. Facebook also points out that Netflix is using algorithms similar to its own to target potential viewers who would be keen to view a film like The Social Dilemma! There are always two sides to a coin. Shades of grey everywhere. Just how much danger am I in, if Instagram knows that I love idlis, cricket, coffee, and books, not necessarily in that order?

Let us therefore take a reality check here, unencumbered by being obsessive users, or alleged perpetrators of stress creating models, in the social media realm. The fact remains that our own choices determine how we interact with the world. When we choose to eat a burger and drink a Coke, we know that they're not good for us, unless we consume them infrequently. Similarly, we should be able to control the time we spend on the internet, and the desire to overdo our involvement with it by avoiding the urge to post personal pictures etc. which need not be posted.

Even if there is a whirlpool, a mass of quicksand, waiting everywhere in the virtual world, to pounce upon our weaknesses, we can avoid it. We must choose not to overdo anything. We must choose to be disciplined. We must choose to distance ourselves from our smartphones for large amounts of time, every day. Balance, as always, is the key. Very few people can remain devoid of social media usage today. I am to attend an online birthday party for a childhood friend, tonight. The social media world is not really demonic in nature, unless we allow it to be. The choice is ours. Be sensible, or be taken for a ride.



THE ARRAY OF THINGS: REVOLUTIONIZING URBAN PLANNING



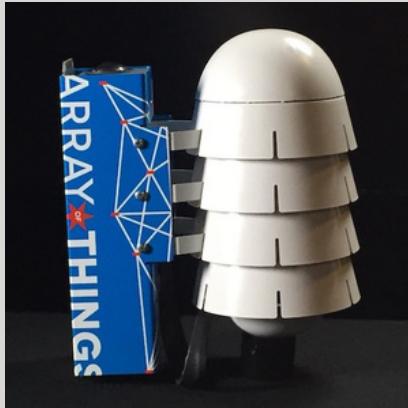
What if a light pole told you to watch out for an icy patch of sidewalk ahead? What if an app told you the most populated route for a late-night walk to the station by yourself? What if you could get weather and air quality information block-by-block, instead of city-by-city?

The Array of Things (AoT) is an experimental urban measurement system comprising programmable, modular "nodes" with sensors and computing capability so that they can analyse data internally, for instance counting the number of vehicles at an intersection (and then deleting the image data rather than sending it to a data centre). AoT nodes are installed in Chicago and a growing number of partner cities to collect real-time data on the city's environment, infrastructure, and activity for research and public use. The concept of AOT is analogous to a "fitness tracker" for the city, measuring factors that impact liveability in the urban environment, such as climate, air quality, and noise.

The goal of AoT is to provide real-time, location-based data about urban environment, infrastructure and activity to researchers and to the public. This initiative has the potential to allow researchers, policymakers, developers and residents to work together and take specific actions that will make cities healthier, more efficient and more liveable. The data will help cities operate more efficiently and realize cost savings by anticipating and proactively addressing challenges such as urban flooding and traffic safety.

Array of Things also serves as the flagship deployment of an innovative new type of cyber infrastructure a distributed, programmable system of nodes that can be used to answer critical





What data Is Collected ?

research questions across different settings and fields of study. AoT is based upon Waggle technology, an open platform for edge computing and intelligent, wireless sensors developed at Argonne National Laboratory. In addition to AoT and other urban research initiatives, Waggle software and hardware supports environmental and atmospheric science in a variety of environments, from the Chicago Botanic Garden to the Atmospheric Radiation Measurement Research Facility in Oklahoma. In October 2019 the Waggle team was awarded a grant from the National Science Foundation for a new project called SAGE: A Software-Defined Sensor Network. SAGE will create a new generation of Waggle node with upgraded sensors and more powerful computing for AI "at the edge." This new node technology will be tested not only in AoT but also in NSF's National Ecological Observatory Network (NEON) with enhanced climate and environmental measurement capabilities, and in the University of California-San Diego's WIFIRE project. NEON operates over 100 environmental measurement sites across the United States, including Alaska, Hawaii, and Puerto Rico, publishing ecological and environmental data to understand phenomena such as the impact of agriculture or urbanization on the natural environment. WIFIRE operates roughly 80 towers across Southern California, providing real-time data for wildfire prevention and response.

The nodes will initially measure temperature, barometric pressure, light, vibration, carbon monoxide, nitrogen dioxide, sulphur dioxide, ozone, ambient sound pressure, and pedestrian and vehicle traffic. Continued research and development is using machine learning to create sensors to monitor other urban factors of interest such as solar light intensity (visible, UV, and IR) and cloud cover (important to building energy management), and flooding and standing water. The Array of Things project is interested in monitoring urban environment and activity, not individuals. In fact, the technology and policy have been designed to specifically minimize any potential collection of data about individuals, so privacy protection is built into the design of the sensors and into the operating policies. Data collected by AoT is open, free, and available to the public. The nodes transmit data to a secure central database server at Argonne National Laboratory. Data is then published openly to allow individuals, organizations, researchers, engineers and scientists to study urban environments, develop new data analysis tools and applications, and inform urban planning. The data collected by AoT can be used to Sensors monitoring air quality, sound, and vibration (to detect heavy vehicle traffic) might be used to suggest the healthiest and unhealthiest walking times and routes through the city, or to study the relationship between diseases and the urban environment. Real-time detection of urban flooding can improve city services and infrastructure to prevent property damage.

oage and illness. Measurements of micro-climate in different areas of the city, so that residents can get up-to-date, high-resolution "block-by-block" weather and climate information. Observe which areas of the city are heavily populated by pedestrians at different times of day to suggest safe and efficient routes for walking late at night or for timing traffic lights during peak traffic hours to improve pedestrian safety and reduce congestion-related pollution. The future scope of AoT is vast and promising. As technology continues to advance, it is likely that the sensors deployed by AoT will become even more sophisticated and accurate. This will enable even more detailed data collection, and allow for more nuanced decision-making. In addition, as the number of cities using AoT grows, it will be possible to compare and contrast data across different urban areas. This will lead to a greater understanding of the factors that contribute to urban health and well-being. One area where AoT is already making a significant impact is in the field of sustainability. By providing detailed information on energy use, air quality, and other environmental factors, AoT is helping cities to develop more sustainable practices. For example, by using real-time data on traffic patterns, cities can optimize transportation systems to reduce carbon emissions and improve air quality. In conclusion, the Array of Things is an exciting and powerful platform that has the potential to transform urban planning and decision-making. As more cities adopt this technology, we can expect to see a wide range of benefits, including improved public health, increased sustainability, and more efficient use of resources. The future of AoT is bright, and we can look forward to many more innovative applications in the years to come.



Amrutha S



Bindhuja SB

Bioinformatics:

A Revolution in Computational Analysis of Biological Data



Before diving into an explanation of bioinformatics, I want to point you that biology is a data-intensive field. Let's stand back and consider the overall picture. The world has always piqued our curiosity as a species. Magellan, Vespucci, and Columbus global explorations have made it possible to find previously undiscovered regions of the globe. In the 20th century, the launching of satellites and space missions into deep space have been prompted by the hunt for extra terrestrial life as well as the desire to better comprehend our planet and galaxy.

In recent years, robotics and laboratory equipment automation have resulted in an exponential increase and generation of "big" OMICS data.

As a result, we now have a better understanding of life and how to improve its quality. What role can OMICS data play in improving people's lives? The solution is to use machine learning to make sense of these biological data, specifically by uncovering hidden patterns in the data. To study life, scientists develop hypotheses, then conduct experiments to validate their hypotheses, resulting in the generation of experimental findings, which literally equates to big data. Historically, genomics was the first OMICS to take off, with initial efforts aimed at an ambitious project called the Human Genome Project, with the goal of unlocking the secrets of life by sequencing all human genes. Although the project's completion produced useful information, it was insufficient to explain all of life's biological secrets on its own. As a result, the ongoing search for answers has naturally led to the exploration of other OMICS such as proteomics, glycomics, lipidomics, and so on.

What is Bioinformatics?

When defining bioinformatics, we should also consider the related term computational biology. Both terms are frequently used interchangeably in the field to refer to the use of computers in biology. Let's look at the differences between the two terms. To begin, bioinformatics refers to the creation of computational resources, tools, software, and databases for the analysis of biological data. Second, computational biology refers to the application of bioinformatics tools to the analysis of biological data. As can be seen, one spectrum is the development of tools, while the other is the application of such tools to analyse and make sense of biological data.

Now Let's Dive into Common tasks in BioInformatics such as Search, Compare, Integrate & Curate and Model. We search Google for information on topics we want to learn more about, we can do the same for biological entities (genes, proteins, DNA, RNA, etc.), chemical entities (compounds, drugs, metabolites, etc.), biochemical pathways, and diseases. There are specialised databases that can be used instead of Google, such as GenBank for gene information, ChEMBL / PubChem / ChemSpider for chemical information, UniProt and Protein Data Bank for protein information, and KEGG for biochemical pathways.

We make comparisons about almost everything in our lives. For example, when deciding which graphics card to purchase, we may consider the price, the technical specifications like number of CUDA cores, VRAM and other factors. Genes or proteins are compared to one another in bioinformatics to determine how similar or dissimilar they are. What similarities do they share?

We know that data collection and cleaning account for 80% of the time it takes to go from raw data to curated data in the data science life cycle. Before we begin data analysis and machine learning model development, we must first decide on the hypothesis or research direction that we will pursue. What research questions (hypotheses) are we going to address? Keeping this in mind, we select subsets of data from the entire database that will assist us in answering the hypothesis. The data is then cleaned in preparation for further data analysis. As the saying goes, "garbage in, garbage out," so we must ensure the data's integrity in order to increase the reliability of the resulting analysis and model.

Model is probably the most enjoyable aspect of all! Models come in a variety of shapes and sizes. A structural model is a 2D or 3D representation of biological or chemical entities made up of virtual atoms linked together by chemical bonds. Atoms (for example, carbon, hydrogen, oxygen, nitrogen, phosphorus, sulphur, and so on) are connected to one another via chemical bonds in a 2D chemical structure. Another example is the 3D protein structure, which is made up of amino acids linked together by peptide bonds. A peptide is a long stretch of amino acids that folds three-dimensionally to form unique "folds" that serve structural and functional roles. Indeed, DeepMind's recent AlphaFold 2 has set a new record by being able to predict protein structural models directly from the amino acid sequence of the protein.

These data is used to gain a better understanding of protein function, protein-protein interactions, and post-translational modifications. Metabolomics is the use of bioinformatics tools to identify and quantify metabolites as well as to analyse metabolic pathways. This data is used to better understand metabolic regulation and the function of various biological systems. Bioinformatics tools are used in drug discovery to identify potential drug targets, predict drug efficacy, and optimise drug design. Bioinformatics tools are used to analyse genomic, proteomic, and metabolomic data in order to develop personalised treatment plans based on an individual's unique genetic and metabolic profile.



Madhu H



Athul M

THE RISE OF GAMING AS A CAREER IN INDIA

E-SPORTS

Over the last decade or so, India has witnessed a tremendous influence of gaming amongst its youth in particular. Even though it is still a novel idea in our country, esports – which essentially refers to organised multiplayer gaming or competitive gaming competitions – has now successfully penetrated both the country's youthful gamers and its vibrant digital media and entertainment ecosystem.

However, until around a decade back, it was considered to be a societal taboo or stigma to play video games as they were portrayed in a negative light; hence esports too was not considered a valid career opportunity for young professionals in India. Cut to today, things have changed for the better drastically, and today in India, a career in esports is considered to be one of the most lucrative, fun, and potent career pathways.

India has been preparing to catch up to other top esports nations. By 2025, it is anticipated that several thousands of more esports teams and esports athletes in India would get ready to participate at the national and international levels.

India has already started sending its esports teams to renowned international platforms such as the Asian Games and Commonwealth Games. Many esports gamers and content creators often having fan base/follower base in millions or billions are also in parallel making the country proud by acing major international esports titles. Owing to this vast rising popularity and acceptance, India has now become the largest esports market in South Asia. No wonder, industry experts are voicing their opinion that now is the time to witness and explore esports as a viable career option, with both the private and government sectors supporting its growth.



Today, the average salary/income range of esports players in India changes from player to player, game to game, and according to their fan base, brand deals, partnerships, followers and subscribers. But the average salary in esports ranges from Rs 30,000 to Rs 1,50,000 or more at times. Many a time, esports teams or organisations would sign up players under salary-based agreements and would additionally provide them various other perks and exciting career growth opportunities as well. Most of the esports streamers/ players don't do it for the money per se, but for their love of the craft, i.e. gaming. Excluding their income, nowadays they also get goodies and complimentary gifts from their sponsored brands. Hence, this is emerging as a most-sought career option that fills one's pockets and soul.

As a matter of fact, the immense support from the fans, brands, and big shots in the industry have all collectively propelled the esports industry into a lucrative space. This in turn is allowing the esports players to have a steady income stream to let them continue following their passion. The esports industry in India and the world, in the near future, is going to rival traditional sports leagues as a competitor in ticket sales, merchandise, and media coverage, among other aspects. The recent tournament, BGMI Masters Series, telecasted on national television shows us how far this industry has grown.

Not everyone can become an esports player or athlete. But Indian esports has a plethora of other opportunities too for everyone depending on their area of expertise and interest. Esports casters and hosts provide commentary on competitions on stage or online. Hosts present tournaments on stage while casters provide commentary on games from a desk or studio. Esports coaches have a similar role to traditional coaches when it comes to training players physically and mentally. Coaching methods changes depending on the particular game they're participating in. Across all social media platforms, social media managers conduct marketing campaigns for their teams, organisations, or leagues as well as create and maintain brand promotions. In esports, administrators or referees keep track of the results, enforce the rules, and impose penalties if needed. There are various production-side roles when it comes to showcasing/streaming of LAN events in the esports arena, such as cameraperson, production manager and crew members, etc. One of the most highly-paid roles on the production front is that of a Show Director who is in charge of LAN titles that are telecasted and may get up to INR 40 lakhs per annum as salary.

Today, a fascinating new era of esports is emerging in India; a time when possibilities are in abundance and the video game industry is becoming extremely competitive, and at the same time, the millennial workforce is constantly expanding and astoundingly tearing down barriers and making possible what was unthinkable a few years back. Going forward, the esports industry will only further continue to prosper and shine. And if you are someone who wants to leverage the esports revolution to build a thriving career, it is never too early or late to start working on your dream. If you are inclined towards a career in esports, then as in every industry hard work and perseverance are of course needed. Hone in your skills and notice where you thrive so you can pick a role in the esports industry of your choice. Attend tournaments and events to socialise with many creators and players so you can gain knowledge from them, and spend time perfecting your skillset, resume, and craft. Also, you must utilise social media to step up your game in every way possible.





Divya
Rajachandran



Arjun

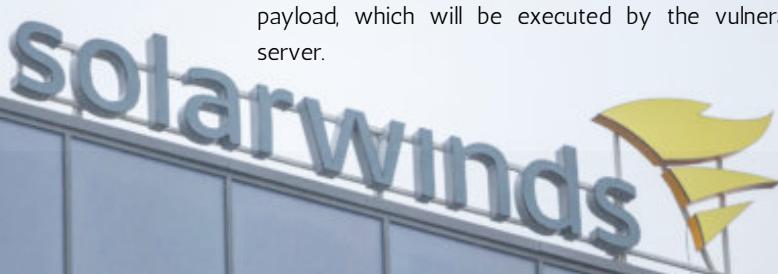
DOUBLE TROUBLE:

EXPLORING THE LOG4J VULNERABILITY
AND SOLARWIND ATTACK

Imagine there's an attacker lurking inside your network right now. Do you have the ability to find out and respond before they can cause harm? Now imagine your adversary has privileged access to virtually every file and system in your IT environment and can impersonate any human, application or machine identity, at any time. Could you spot the attacker hiding in plain sight? The SolarWinds attack was a highly sophisticated supply chain attack that affected numerous organizations worldwide, including government agencies and large enterprises. The attackers inserted malicious code into the SolarWinds Orion software, which allowed them to gain access to the victim's systems and exfiltrate sensitive data. The attack was carried out in several stages and went undetected for several months. On the other hand Log4j vulnerability, identified as CVE-2021-44228, is a severe vulnerability in Log4j, a popular Java-based logging utility used by many organizations to log system events. The vulnerability allowed an attacker to remotely execute arbitrary code on a vulnerable system, potentially leading to data theft and system takeover. Let's dive deep into these 2 major security incidents.

In December 2020, a series of network breaches was reported in rapid succession the beginning of what soon became known as the cyber attack that changed everything. By compromising identities and abusing privileges to take advantage of a routine software update, the sophisticated adversaries behind the landmark SolarWinds attack reached into more than 18,000 organizations, showing the world just how devastating a supply chain attack could be. A supply chain attack is a type of cyber attack that targets vulnerabilities in a third-party supplier's software or hardware components to gain unauthorized access to a target organization's network or data. In this type of attack, the attacker seeks to compromise a trusted supplier's products or services, such as software updates or hardware components, to introduce malware or other malicious code into the target organization's network. The SolarWinds attack, also known as the SUNBURST attack, was a supply chain attack that targeted SolarWinds, a US-based software company that develops IT management software. The attackers compromised SolarWinds software build process and inserted malicious code into the SolarWinds Orion software, which was used by many organizations worldwide to manage their IT infrastructure. The malicious code, which was designed to be stealthy and difficult to detect, allowed the attackers to gain access to the victim's systems and exfiltrate sensitive data. The attack was carried out in several stages, with the initial compromise occurring in late 2019. The attackers spent several months conducting reconnaissance and moving laterally across the victim's networks before exfiltrating data in mid-2020.

Almost exactly a year later, the world faces a new threat of potentially equal or even greater proportions: the Log4j vulnerability that is putting "hundreds of millions of devices" at risk, according to U.S. CISA officials. On December 10, 2021, a critical security vulnerability in a widely used open-source software development library called Log4j (also referred to as "Log4Shell") was published in CVE-2021-44228. Affecting Log4j versions 2.0 beta9 to 2.14.1, the flaw has the potential to cause data exfiltration and remote code execution on servers using this component for their logging functionality. Log4Shell has quickly gained global attention because of its potential for far-reaching impact. The Log4j open-source software is ubiquitous, used either directly or indirectly (via third-party code) in the world's most popular consumer applications and enterprise services. When left unmitigated, the remote code execution (RCE) vulnerability can enable an attacker to execute arbitrary Java code and take control of a target server. Attackers reportedly began exploiting the vulnerability at the beginning of December 2021 (though it was inserted into the code in July 2017) and have ramped up efforts since the CVE's publication efforts include those by known ransomware groups. Log4j's code that handles the processing of user input. Specifically, the vulnerability is caused by a flaw in the way Log4j handles the "lookup" feature in its configuration file. The "lookup" feature in Log4j allows developers to dynamically load classes and execute arbitrary code, such as JNDI lookups, to set values for certain configuration options. However, this feature can be exploited by an attacker to execute arbitrary code remotely. An attacker can craft a specially crafted request to a vulnerable Log4j server that contains a reference to a malicious JNDI (Java Naming and Directory Interface) server. When the Log4j server processes the request, it will attempt to resolve the JNDI reference, which will cause it to connect to the malicious JNDI server. The malicious server can then send a response that contains a reference to a class with a malicious payload, which will be executed by the vulnerable Log4j server.



Both incidents highlight the need for organizations to prioritize cybersecurity and take proactive measures to prevent and mitigate the impact of cyber attacks. This includes regularly updating software and systems, conducting security assessments, and implementing strong security controls and best practices.

HOW JIO CHANGED THE FACE OF THE TELECOM INDUSTRY IN INDIA



Shan Ali
Hassan



India's richest man is catapulting hundreds of millions of poor people straight into the mobile internet age. Mukesh Ambani, head of Reliance Industries red down pointing triangle, one of India's largest conglomerates, has shelled out \$35 billion of the company's money to blanket the South Asian nation with its first all-4G network in 2016. By offering free calls and data for pennies, the telecom latecomer has upended the industry, setting off a cheap internet tsunami that is opening the market of 1.3 billion people to global tech and retailing titans.

Mr. Ambani's success or failure could affect Alphabet Inc.'s Google and Facebook Inc.'s WhatsApp, which have poured resources into developing products for the Indian market, and Walmart Inc. and Amazon.com Inc., which have invested billions here on logistics for online shoppers. To profit, they all need people connected to the internet. Mr. Ambani wasn't available to comment, according to a Reliance spokesman. The company "has unleashed huge data potential in the country," the spokesman said. "Digital life will no longer be the privilege of the affluent few." There are 390 million internet users in India, according to Bain & Co., but the penetration rate is still only 28%, compared with 88% in the U.S. The country's e-commerce market is expected to be worth \$33 billion this year, three times what it was in 2015, but less than 3% of India's overall retail market, according to research firm eMarketer.



He got online last year with Reliance Jio Infocomm Ltd., Mr. Ambani's telecom company, which built a tower nearby that beams his phone nearly unlimited 4G data for about \$2.10 a month. Jio, which means "to live" in Hindi, has signed up 215 million subscribers since it went live in 2016, making it India's No. 4 mobile provider, after Bharti Airtel Ltd., with 345 million, Vodafone Group PLC and Idea Cellular Ltd. Mr. Ambani's foray started in 2010, when he bought a company that had just acquired a pan-India 4G license. That was a risky move at a time when fewer than one in 10 Indians were online. Airtel and Vodafone were still focused on rolling out 3G services, and few Indians owned 4G-capable smartphones.

Fourth generation, or 4G, networks provide significantly faster speeds than 3G, enabling more content like streaming video and music. They also provide the steadier connections important for online shopping, which can be difficult on patchy networks. 4G networks are common in the U.S., Europe and East Asia. Mr. Ambani, now 61 and worth more than \$48 billion, had just finished building what some have dubbed the world's most expensive home, a 27-story mansion on a hill with views of the Arabian Sea. It was packed with bling—helipad, home theater, gym, garden, pool—but the internet connection was bad. At the time, India's telecom industry executives and analysts agreed there was need for more speed, but they doubted enough people would be willing to pay for it. Indians then were spending only about \$2 a month on their cellphones, the vast majority of that on voice calls.

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The result has been a data binge. Jio transmitted more data in the first year of its operation than any carrier ever world-wide, according to research firm Strategy Analytics. India last year surpassed the U.S. in the number of apps downloaded from the Google Play store, according to mobile-app analytics firm App Annie. Monthly data traffic in India per user has jumped 570% in the two years after Jio launched, according to Morgan Stanley.

There is a term fixed cost of wiring the cables under the ocean. Mukesh ambani created a gateway in bay of bangal with a new technology fiber optic cabling length 8000 km which is part of the existing fiber cable from Europe going up till South Asia to Malaysia and Singapore. In this the cost of spreading cables is fixed. But this fixed cost had already been invested in old 2g/3g technology by Vodafone, Idea and Airtel. But Mukesh ambani directly invested that money in new 4g technology which has the speed o 40TB/s on the contrary, other companies don't even have the speed of 4TB. Mukesh Ambani didn't have the burden of 2g/3g network hence this is the only company to have 22 zones of 4g network while Airtel has 15 zones, Idea 10 and Vodafone 8. Apparently Mukesh ambani has a great vision. He then started spreading his internet that's why he started giving 8 sim in one aadhar card and also boost up the speed of sim activation. He wanted to capture the 80% of telecom market. The success saga of Jio continues.



Saranya K



Unnimaya U

GEN V: RISE OF AI-POWERED CYBER ATTACKS

In the year 2023, cybersecurity threats are becoming more advanced and sophisticated, posing significant risks to companies across various industries. With the proliferation of technology and the rise of remote work, businesses must take proactive measures to stay ahead of these threats and protect their valuable data and assets. This article will discuss some of the cybersecurity threats that companies may face in 2023 and provide strategies to stay ahead of the game. The losses due to cybersecurity threats in the past 10 years have been significant and have grown at an alarming rate. The exact figures are difficult to estimate, as many organizations do not disclose the full extent of the damage caused by cyber attacks. In 2020, the global cost of cybercrime was estimated to be \$1 trillion, up from \$600 billion in 2018, according to a report by McAfee.

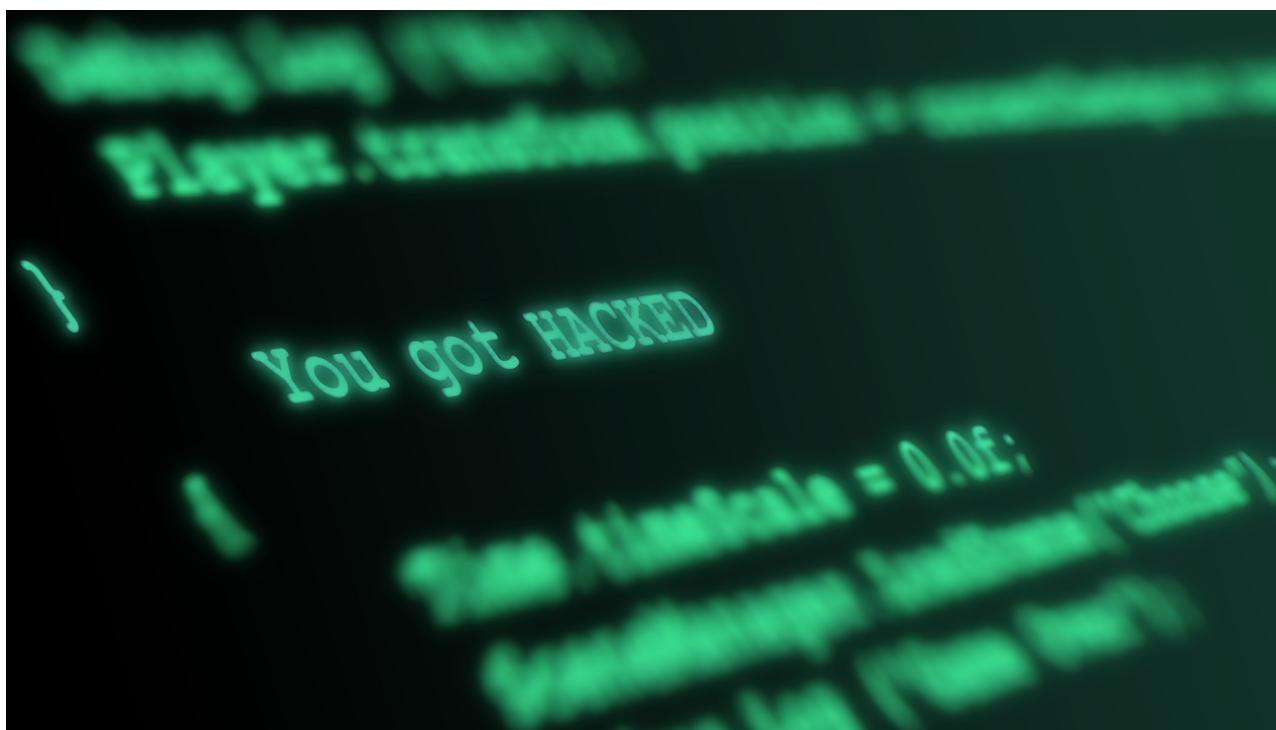
Generation V Cyberattacks differ from their predecessors in a variety of ways, the most prevalent difference being the wide range of technologies that they can target, from mobile phones to entire cloud networks. As a result, Gen V attacks can occur across countries, companies, and even continents. An example of this broad scale is the WannaCry attack that cancelled thousands of doctor's appointments in the UK while simultaneously crippling the computer systems of German National Railways and Telefonica. The final defining characteristic of Gen V attacks is the technology used to carry them out. When a Gen V attack occurs, it is done using "state-sponsored" technologies. State-sponsored technologies are those developed by large companies or through government sponsored projects. These technologies are now falling into the hands of attackers either as result of simple leaks or as the result of reverse engineering, creating a next generation cybersecurity problem for industry. Gen V cyber-attacks are the result of a complex cat and mouse game played by cyber-attackers and cybersecurity professionals over the past forty years. This game led to an evolution in cyberattacks and cybersecurity. It is important to understand this evolution because it explains how attacks like WannaCry and NotPetya occurred and had such a monumental impact.



The first generation of cyberattacks consisted of viruses carried on discs that would need to be inserted into computers. These viruses were limited in scope because they were confined to attacking one computer at a time. To combat this, security providers developed antivirus software. The second generation, which came about in the early 90s, consists of internet-based attacks. As computers grew increasingly interconnected, cyber-attackers became able to attack more computer systems, more rapidly. In response to this evolution, the first firewalls came about. In the early 2000s, cyber-attackers again evolved to hone in on apps with internet access such as web browsers. Security professionals combated this third generation of attacks with a variety of tools, the most prevalent being IPS Software. This time, cyber-attackers tweaked their methods to make their malware more polymorphic. With advanced software, malware could take a different form in different attacks, making it more difficult to detect and trace them. In response to this cybersecurity problem, security developers introduced response techniques like sandboxing and anti-bot software. In other words, in the current environment cyber attackers are playing chess and putting their targets in checkmate, while their targets would struggle to beat them in checkers. This difference in capability is daunting and is one of the most prevalent cybersecurity problems facing professionals today. With this gap in mind, the obvious question to ask is, "What can security providers and companies do to catch up to the attacks they're trying to prevent?". This Gen V cybersecurity architecture must be built on a foundation of real-time threat prevention technologies. Because Gen V cyber-attacks are too fast for security systems to perform reactively, the focus when solving this cybersecurity problem needs to be on preventing attacks before they take hold. In 2018 cyber security teams have found themselves behind a sizable 8-ball, with the attacks they work to prevent evolving to become bigger, faster and stronger.

These attacks can seemingly only become more prevalent in the future, and this prevalence will only further necessitate the growth and evolution of security measures.

These attacks can seemingly only become more prevalent in the future, and this prevalence will only further necessitate the growth and evolution of security measures. In summary, the impact of Gen V attacks can be significant and far-reaching, including financial damage, reputational damage, legal and regulatory consequences, business continuity disruptions, and national security risks. To defend against these attacks, organizations must implement advanced security measures and stay up to date with the latest trends and developments in the cybersecurity landscape.



Linux at 30's: The Undefeated Realm



Vishnu S

In 1991, a Finnish university student named Linus Torvalds had begun working on his personal kernel development project. Torvalds was interested in using a UNIX-based operating system, but found that the available options were too expensive for a student's budget. Torvalds himself has said that BSD been freely available at the time, he would probably never have embarked on his project. Yet when BSD found its legal footing, Linux was already on its way, embraced by the types of minds that would help turn it into the operating system that would eventually run most of the world. The pace of development picked up quickly. Userspace utilities from the GNU operating collected around the Linux kernel, forming what most would call "Linux," much to the chagrin of the GNU founder Richard Stallman. At first, Linux was the domain of hobbyists and idealists. Then the supercomputing community began taking it seriously and contributions ramped up further. By 1999, this "hobby" operating system was making inroads in major corporations, including large banking institutions, and began whittling away at the entrenched players that held overwhelming sway.

A common misconception about Linux persists to this day: that Linux is a complete operating system. Linux, strictly defined, is the Linux kernel



The producer of a given Linux distribution be it Red Hat, Ubuntu, or another Linux vendor defines the remainder of the operating system around that kernel and makes it whole. A Linux system can be as large or as small as needed. Adaptations of the Linux kernel can drive a supercomputer or a watch, a laptop or a network switch. As a result, Linux has become the OS for mobile and embedded products while also underpinning the majority of internet services and platforms.

To grow in these ways, Linux needed not only to sustain the interest of the best software developers on the planet, but also to create an ecosystem that demanded reciprocal source code sharing. The Linux kernel was released under the GNU Public License, version 2 (GPLv2), which stated that the code could be used freely, but any modifications to the code or use of the source code itself in other projects required that the resulting source code be made publicly available. In other words, anyone was free to use the Linux kernel and the GNU tools, also licensed under the GPL as long as they contributed the resulting efforts back to those projects. This created a vibrant development ecosystem that let Linux grow by leaps and bounds, as a loose network of developers began molding Linux to suit their needs and shared the fruit of their labor. If the kernel didn't support a specific piece of hardware, a developer could write a device driver and share it with the community, allowing everyone to benefit. If another developer discovered a performance issue with a scheduler on a certain workload, they could fix it and contribute that fix back to the project. Linux was a project jointly developed by thousands of volunteers.

Commercial enterprise OS vendors dismissed Linux as a toy, a fad, a joke. After all, they had the best developers working on operating systems that were often tied to hardware, and they were raking in cash from companies that relied on the stability of their core servers. The name of the game at that time was highly reliable, stable, and expensive proprietary hardware and server software, coupled with expensive but very responsive support contracts. To those running the commercial Unix cathedrals of Sun, DEC, IBM, and others, the notion of distributing source code to those operating systems, or that enterprise workloads could be handled on commodity hardware, was unfathomable. It simply wasn't done until companies like Red Hat and Suse began to flourish. Those upstarts offered the missing ingredient that many customers and vendors required: a commercially supported Linux distribution. The decision to embrace Linux at the corporate level was made not because it was free, but because it now had a cost and could be purchased for significantly less and the hardware was significantly cheaper, too.

While the first 15 years of Linux were busy, the last 10 have been busier still. The success of the Android mobile platform brought Linux to more than a billion devices. It seems every nook and cranny of digital life runs a Linux kernel these days, from refrigerators to televisions to thermostats to the International Space Station. That's not to say that Linux has conquered everything yet. Though you'll find Linux in nearly every organization in one form or another, Windows servers persist in most companies, and Windows still has the lion's share of the corporate and personal desktop market. In the short term, that's not changing. Some thought Linux would have won the desktop by now, but it's still a niche player, and the desktop and laptop market will continue to be dominated by the goliath of Microsoft and the elegance of Apple, modest inroads by the Linux-based Chromebook notwithstanding. That freedom is a double-edged sword. If a Linux distribution makes a few poor choices and loses ground, other distributions will take a different approach and flourish. Linux distributions are not tied directly to Linux kernel development, so they come and go without affecting the core component of a Linux operating system. The kernel itself is mostly immune to bad decisions made at the distribution level. That has been the trend over the past 31 years from bare metal to virtual servers, from cloud instances to mobile devices, Linux adapts to fit the needs of them all. The success of the Linux kernel and the development model that sustains it is undeniable. It will endure through the rise and fall of empires.



P Malavieka

FROM FREE TO FEE: FUTURE OF FREE WEB SERVICES

Amidst all the ChatGPT craze, another trend has been picking up in the tech world especially among social media giants and it is “paid verification”. Mark Zuckerberg’s Meta Platforms announced that the company had jumped on the bandwagon and said it would be testing paid verification services for Facebook and Instagram, just months after the Twitter Pay Per Blue Tick announcement. Known as the Meta Verified feature, the company said it would be an Instagram and Facebook subscription bundle with a verified badge to authenticate a user’s account with a government ID, proactive account protection, account support, and increased visibility and reach. The Meta Verified subscription would also include extra protection against impersonation. It will be priced at US\$11.99 per month on the web or US\$14.99 monthly on Apple’s iOS and Android. Following the footsteps of the rival platform Twitter, Mark Zuckerberg, the Chief Executive Officer of Meta, announced in a Facebook post that the service would first roll out in Australia and New Zealand first. In addition to a blue badge for the service, Zuckerberg said Meta would offer “extra impersonation protection” improved reach for verified users, and direct access to customer support. The increased visibility of posts from verified users would “depend on a subscriber’s existing audience size and the topic of their posts” the company said. Those with smaller audiences might see more of an impact. The company said it would also offer “exclusive stickers” on Facebook and Instagram stories and Facebook reels. At this stage, the service would be available to businesses later, Meta said.

In response to the news, Twitter’s CEO, Elon Musk, tweeted that it was “inevitable” Meta would follow Twitter. Interestingly, Twitter also announced that it would provide SMS-based two-factor authentication, but only to users who are subscribed to the US\$8-a-month Twitter Blue service available from March 20, 2023, onwards. Currently, Twitter provides free two-factor authentication through third-party apps and a security key, which is considered more secure than SMS-based systems. Should non-subscriber accounts that use SMS authentication not switch before the deadline, Twitter said it would disable two-factor authentication for that account.

The company believes phone-number-based 2FA is being abused by “bad actors” according to a blog post that the company’s tweet linked to last Wednesday. To recall, the third iteration of Twitter Blue was unveiled in December 2022, and it allows users to buy Twitter’s blue tick for US\$8 on a browser or US\$11 on an iOS device per month. Twitter Blue subscribers will get access to subscriber-only features such as Edit Tweet, 1080p-resolution video uploads, and reader mode. Similar to Meta Verified, subscribers of Twitter’s paid verification services will also receive a blue checkmark after their accounts are reviewed to ensure they meet all of the requirements, including rules against impersonation. So far, Twitter Blue is only available in the US, Canada, Australia, New Zealand, and the UK and roll out to other countries following days.



For the longest time, the internet was based on the ethos that everything was free. As the internet has evolved and companies realize the value they create should no longer be accessible for free, subscription-based models have grown exponentially. As stated in a Bloomberg report, “subscriptions have always offered a tantalizing alternative to advertising, but social networks have traditionally stayed free as a way to encourage user growth and engagement, which is then subsidized with paid marketing posts.”



Even before Meta and Twitter made their recent move, other social media apps such as Snap Inc’s Snapchat and the messaging app Telegram had already launched paid subscription services. Before that, even YouTube started offering a paid version that removes ads, allows offline viewing, and enables background app playing. Additionally, platforms like Patreon, OnlyFans, and Twitch have used paid subscription models to retain users and content creators. While some platforms subscription services focus on exclusive access to creators, some focus on removing ads, while others are trying a mix of both. Most social media platforms, especially Twitter and Meta, are still in the early stages of their paid services. So far, subscription-based platforms like Patreon and Substack have demonstrated success in this field by creating a more personal experience between the audience and the content creators.

CHATGPT 4

A COMPREHENSIVE REVIEW



Hibamol C

-GPT-4-

Microsoft Corp-backed startup OpenAI began the rollout of GPT-4, a powerful artificial intelligence model that succeeds the technology behind the wildly popular ChatGPT. GPT-4 is "multimodal", which means it can generate content from both image and text prompts. GPT-3.5 takes only text prompts, whereas the latest version of the large language model can also use images as inputs to recognize objects in a picture and analyze them. GPT-3.5 is limited to about 3,000-word responses, while GPT-4 can generate responses of more

than 25,000 words. GPT-4 is 82% less likely to respond to requests for disallowed content than its predecessor and scores 40% higher on certain tests of factuality. It will also let developers decide their AI's style of tone and verbosity. For example, GPT-4 can assume a Socratic style of conversation and respond to questions with questions. The previous iteration of the technology had a fixed tone and style. Soon ChatGPT users will have the option to change the chatbot's tone and style of responses, OpenAI said.

The latest version has outperformed its predecessor in the U.S. bar exam and the Graduate Record Examination (GRE). GPT-4 can also help individuals calculate their taxes, a demonstration by Greg Brockman, OpenAI's president, showed. The demo showed it could take a photo of a hand-drawn mock-up for a simple website and create a real one. Be My Eyes, an app that caters to visually impaired people, will provide a virtual volunteer tool powered by GPT-4 on its app. According to OpenAI, GPT-4 has similar limitations as its prior versions and is "less capable than humans in many real-world scenarios". Inaccurate responses known as "hallucinations" have been a challenge for many AI programs, including GPT-4. OpenAI said GPT-4 can rival human propagandists in many domains, especially when teamed up with a human editor. It cited an example where GPT-4 came up with suggestions that seemed plausible, when it was asked about how to get two parties to disagree with each other. OpenAI Chief Executive Officer Sam Altman said GPT-4 was "most capable and aligned" with human values and intent, though "it is still flawed." GPT-4 generally lacks knowledge of events that occurred after September 2021, when the vast majority of its data was cut off. It also does not learn from experience. While GPT-4 can process both text and image inputs, only the text-input feature will be available to ChatGPT Plus subscribers and software developers, with a waitlist, while the image-input ability is not publicly available yet. The subscription plan, which offers faster response time and priority access to new features and improvements, was launched in February and costs \$20 per month. GPT-4 powers Microsoft's chatbot and some features on language learning platform Duolingo's subscription tier.

We asked GPT-4 about its impact on the Indian jobs market and whether it will take away jobs or create more jobs. As expected, the AI bot replied saying 'I can't predict the future with certainty'. It then goes on to say that it can provide insights based on existing trends and observations. Talking about potential job loss, the AI bot said that "ChatGPT and similar AI technologies have the potential to automate certain tasks that previously required human intervention, particularly in customer service, content creation, and data analysis. This could potentially lead to job displacement in these sectors". It further mentions that AI can perform some tasks faster and more accurately than humans, thus making certain job roles 'less relevant over time'.

In its reply, ChatGPT also lists out factors that can result in job creation. AI technologies like ChatGPT, it says, can open up new job opportunities in areas such as AI development, research, and implementation. However, these roles may require different skill sets and expertise, creating demand. The answer further mentions that AI can be used as a tool to augment human capabilities, making people more efficient and productive in their jobs. This could lead to the creation of new roles that work alongside AI technologies, rather than replacing existing jobs, it states. For new talent. On economic growth, ChatGPT said that the increased efficiency and productivity enabled by AI technologies can contribute to overall economic growth of the country, which may result in new jobs indirectly in various sectors. ChatGPT concludes its answer saying that the impact of AI technologies like ChatGPT on jobs in India or any other country will depend on factors like government policies, industry adaptation, workforce skills, and education systems. It suggests that emphasizing on reskilling and upskilling, as well as fostering a culture of lifelong learning, can help individuals adapt to the changing job market and capitalize on new opportunities created by AI advancements.

Moments



Donating Copies of Text Book "Business Management in a Nutshell"



Vishu X Easter Celebration



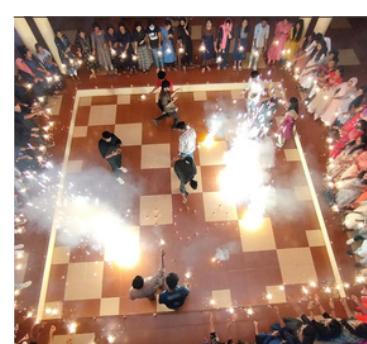
Wonderla Trip



Onam Celebration



Sharing Day



Deepawali Celebration



Kerala Piravi

Moments



Speak For India



Debate Session



MCA Association
Inauguration



Shootout
Competition



NeCTAR



Industrial Visit



Snehamrutham

Moments



Yoga Session



MCA Cricket Team



Poster Designing Competition



Honouring Rank Holders



Christmas Celebration



Christmas Celebration at Ammaveedu

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MCA Association Report

TEAM MCA Is one of the finest department in the NCERC campus. Here the students are paved with a golden platform to build a strong career by guiding them through a proper path. The department is performing various activities coordinated by Association. The Association help the students to grasp idea about the new technical improvement in the world. provide certain club activities to improve communication and written skills. The magazine which help the students to improve their presentation proficiency. Social extension activities is being performed to make awareness about the importance of welfare activities in the inner minds of every students. The technical fest called Prayaana is conducted with the active participation of students from various colleges. MCA Association is well set to face the challenging trends in the surroundings by living life digitally and applying it in the respective domain.

Team MCA office bearers 2022-23

- Faculty Coordinator: Ashish L
- Student Chairman: Melvin Vincy
- Student Secretary : Aparna Anavankot
- Student Spokeperson: Varsha J
- Student Coordinator Public Relations : Sreejith K M

Inauguration

The official inauguration of MCA Association for the academic year 2022-2023 was held on NCERC Pambady. The ceremony began by reminiscing the efforts and endeavors of our honorable founder Chairman, late Sri.P.K Das, followed by a silent prayer.

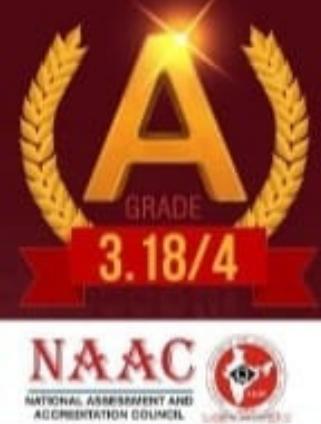
Other activities

1. MCA batch of 2021-23 donated Copies of the Textbook "Business Management in a Nutshell" to the library.
2. Celebrated Vishnu & Easter with cultural programmes arranged by students.
3. Prayaana, the south zone intercollegiate tech fest conducted by arranging games and cultural programmes.
4. International Conference on Emerging Trends in Signal Systems & Informations is coordinated in the month of May.
5. Yoga Sessions has been conducted on the Yoga day
6. Spent a day in Wonderla theme park as students outing.
7. Poster Design Competition organised on National Librarians Day.
8. Won 1st prize for pookkalam in Onam festival layed out by NCERC.
9. Students prepared deserts and shared among them as part of Pooja festival.
10. Deepavali is Celebrated with a number of activities.
11. Kerala Piravi is Celebrated with full glory.
12. Prof.Dr.JKM Nair released the conference proceedings of new version of NeCTAR "Technologies Annexing Reality".
13. Snehamrutham, a new venture of helping needy once by providing food as a part of social extension wing.
14. Debate session conducted by Association
15. Menstrual Hygiene Session is conducted for female students.
16. MCA Association Inaugration with new cheifs on the mantle.
17. Shootout competition is conducted, based on worldcup theme.
18. Christmas is celebrated with the inmates of Ammavedu
19. Industrial Visit is conducted for the 2nd year students.

NGI

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(Artificial Intelligence & Machine Learning)
- Pharmaceutical Engineering *

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- Cyber Security
- Energy Systems
- VLSI Design

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M.C.A



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