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“BE INTERESTED, COMMITTED AND REPEATED”

Dr. Arun Kumar
Principal,
VIVA Institute of Technology

Dear Readers,

I feel delighted to see the dynamics of faculty and students of computer engineering department for giving a new level to TECH-NEXT. This technical magazine will be the source of motivation for faculty and students to remain interested and committed for the growth of the department and the institute. I would like to congratulate the editorial team for their effort in this regard. I wish all the best to the entire team for the future.

"GOING OUT OF YOUR COMFORT ZONE WILL GREATLY IMPROVE YOUR CONFIDENCE"

Dr. Ashwini save
HOD, Computer Engineering

Dear Readers,

It gives me immense pleasure to announce the publication of Volume 6, Issue 1 of our Technical Magazine 'TECH-NEXT': A Biannual Technology Review Magazine'. In the computer Engineering Department, VIVA Institute of technology we have always strived to provide quality and relevant education to the students. For the same reason we have undertaken and new technologies for students and faculties. Short Term Training Programmes are also arranged for educators on new technologies and on research topics. We at the department successfully conducted training programmes on "Cloud Computing", "Machine Learning and Natural Language Processing" and a certification course on "Ethical Hacking and IT Security".

The department has taken initiatives where the students are able to present seminars or conduct workshops on any new technologies that they might have learnt. Keeping in line with this and to encourage the students and faculties alike it was decided to launch the TECH-NEXT magazine in the year 2016. The magazine provides a platform for the students, faculties and technical minded people to share ,express and present their views and reviews on the current trends in technology. I would like to express my gratitude towards our principal sir Dr. Arun Kumar and Dr. Narendra Shekokar, Professor and Head of Computer Engineering Department at Dwarkadas J. Sanghvi College of Engineering for guidance that they have rendered to us. The main idea behind the magazine was to provide the students a platform to express their knowledge on technology. In line with this we decided to go for securing the Internal Standard Serial Number for our magazine and it gives me great pleasure to announce that we have been successful in our endeavour. Our technical magazine was granted ISSN (Online), ISSN (Online):24565105, by the government. I'm sure that this will prove to be very beneficial for the students and gives credibility to the articles published in the magazine.

"THE BEST WAY OUT IS ALWAYS THROUGH."

Prof. Vinit Raut
Chief-Editor, TECH-NEXT

Dear Readers,

We at computer engineering department, VIVA Institute of Technology started the technical magazine 'TECH-NEXT: A Biannual Technology Review Magazine' with the rational that we need to and we should be focusing on the next generation technologies which are becoming or which will become an integrated part of our life. So, we as technical professionals understand the importance and impact of these new technologies on our lives and make the readers aware of the same. In line with this, this is the 1st issue of the 6th volume of our Technical Magazine 'TECH-NEXT'.

The first issue of the first volume of the technical magazine predominantly contained articles written by faculty of our department. During the launching of our magazine, it was suggested to us that we should also have more articles from the students. I'm very happy to share with you that from then on more than 95% of the articles published have been contributed by students. The response from students was so verwhelming that we on the editorial board were able to select only a few articles that were submitted. We have also achieved a major milestone by securing International Standard Serial Number (Online), ISSN (Online): 2456-5105. We believe that, with this, the articles published in our Technical Magazine will garner reputation and will be beneficial for the contributors for their personal and professional growth.

I would like to thank all my editorial team members for helping me pull this through. I express my considerable appreciation to all the authors of articles in this magazine. Contributors for the next issue of the Technical Magazine will have to send their articles to "tech-next@viva-technology.org". And, we hope to publish the forthcoming soon thereafter as well. Until then, happy reading and keep spreading awareness of technology.

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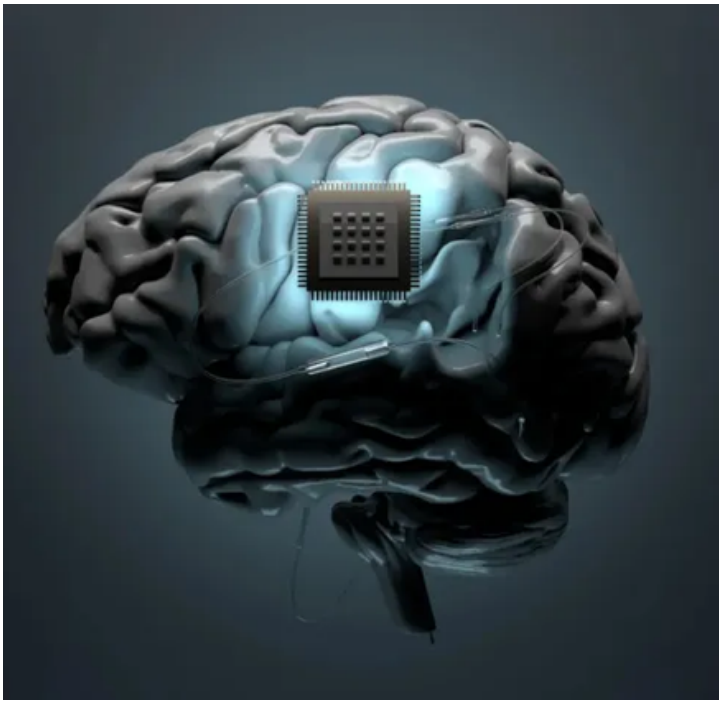
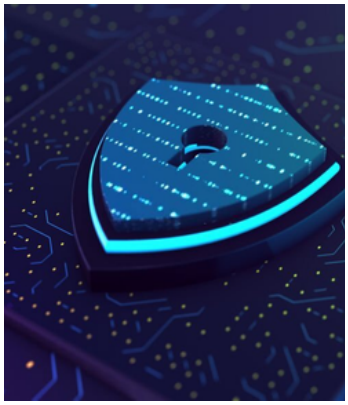
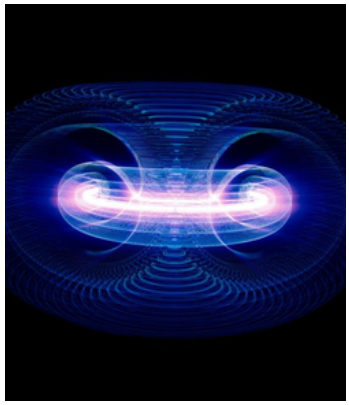
CONTENTS

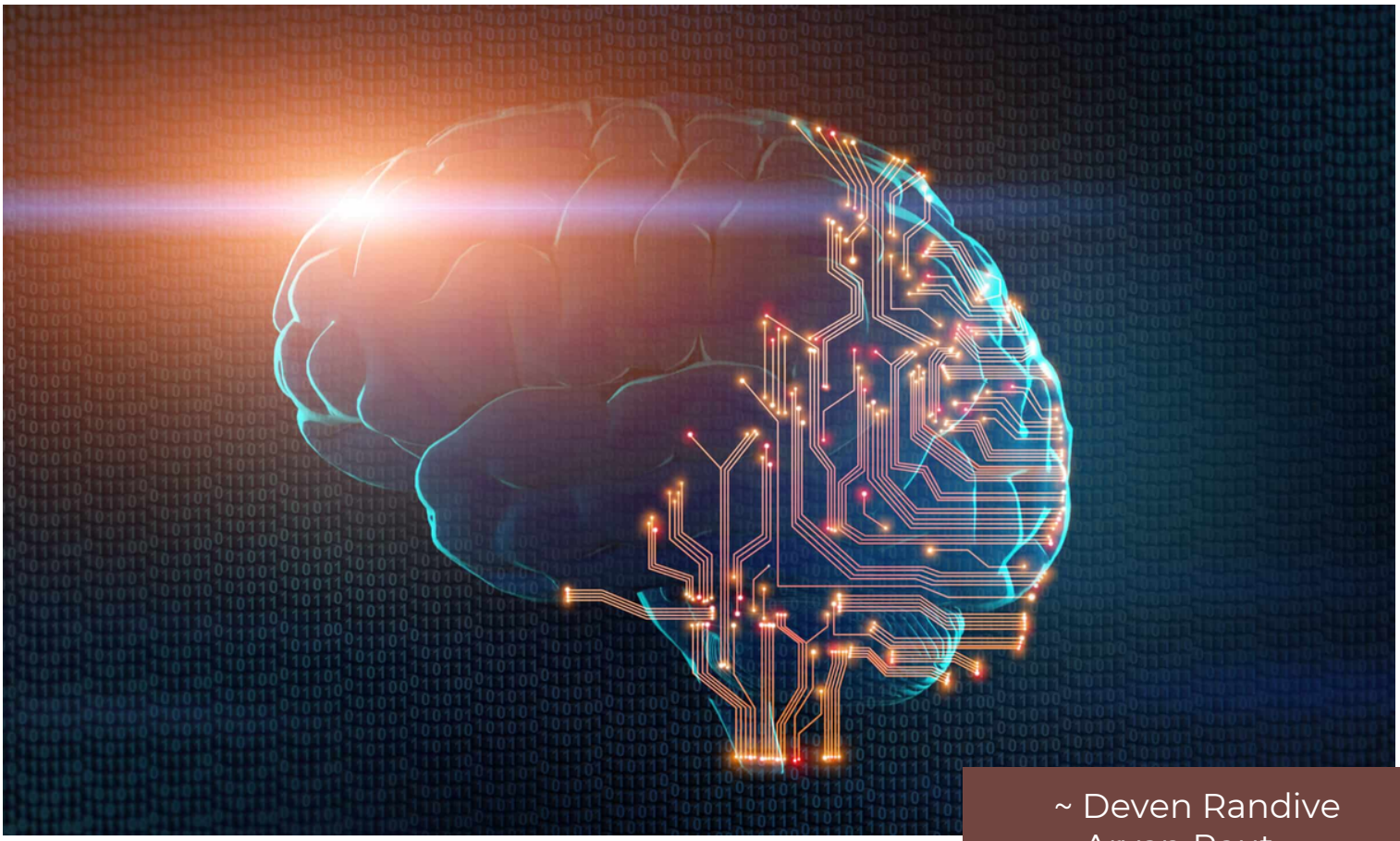






INDEX

NEURO CHIP



~ Deven Randive
~ Aryan Raut
~Yash Patil

INTRODUCTION :

The speed of knowledge transmission has inflated by multiples of millions. The time we've to create right selections is shorter and shorter. As humans face an option to new dark age, they have technological revolution. Time to search out new humanity it's clear that today's revolution desires deepest social transformation. rather than wasting resources on finding fugitive issues it's time to specialize in technology of future that finds new supply and energy. Human psychological feature ability with brain chips implant. Brain chips interface could be a large set of interconnections in which the chip and therefore the nerve cells of our brain act with one another to transfer electrical signals from brain to laptop or computer to brain via chip. In other words, we tend to can say that no matter brain cells say are going to be picked up by computer however it's a 2 means communication, that the computer also can communicate back to the chip by giving the directions to perform the precise task. Machines that act like human brain looks like science fiction. It's like fusion of neurobiology and engineering. Brain chips are built by mistreatment NANO TECHNOLOGY that aims at changing somebody's being into SUPERHUMAN. it's miraculous applications within the field of neuro science engineering and speed recognition. It's been a ground breaking innovation. A lot of the analysis, the more enhancements nowadays individuals suffer from neurologic disorders which are deadly conditions they're suffering from. concerning one billion lives suffer from neurological disorders in each country, which accounts to seven million deaths every year. when many years of research several individuals believe that the BRAIN CHIPS INTERFACE TECHNOLOGY (BCI) will play a significant role in addressing these neurologic issues. Brain chips interface will be constituted in human brain as its half which might mimic all the functions of brain mathematically, can record it and send it to computers.

HOW DOES IT WORKS?

The chip may be implanted within side the human mind. The extension cord of chip is attached to pedestal connector that data all of the styles made through neural connections that controls all of the sports of mind. Then this connector sends all of the alerts to neural sign interpreter through fibre optic cable. The neural sign interpreter converts the mind alerts into virtual alerts and sends it to laptop; the laptop mimics all of the capabilities of mind sports and sends it to the prostatic tool which allows sufferers to do movements just by the thoughts of the patient's brain.

ELECTROENCEPHALOGRAM

EEG is that the device that records each single activity of brain through the electrically signals sent by nerve cells of brain. They record each pattern and image of neural connections and sends back to the pc via chip. There are different electric signals in neural networks of brain creating different patterns for every activity an individual's brain does. If the patient says affirmative for a piece, then there'll vary pattern if a patient says no through its thought once more the computer receives a special unique pattern. when recording each activity, it converts the brain signals to digital information and sends it to the computer. graphical record is accountable to convert the electrical signals of the brain nerve cells to digital data and vice versa. Researchers have unreal an EEG cap that records human brain useful signals.

EVOLUTION OF NEURO CHIP

Brain chip implants are grasp a part of fashionable culture. In 1929 the device known as encephalogram (Electro Encephalography) was made-up by HANS BERGER within the field of human brain analysis that helped to record the human brain signals. once it involves this subject, we tend to keep in mind the works of JOSE DELGADO who established electrodes in animal brain and connected them to a "STIMOCEIVER".

In 1998 the scientist PHILP KENNEDY implanted the primary brain contribute human brain to record brain activity. In 2001 JOHN DONOGHUE and his team at Brown researchers, cyber kinetics made-up brain gate then in 2004 dessert apple WOLPAW and its scientist at the big apple state invented an encephalogram cap then IBM invented a wireless Brain Chip Interface that is 4mm in size and has 5.4 billion transistors interconnected in chip, capable of stimulating one million neurons and 256 million neural connections. government agency (The closemouthed analysis arm of department of defence) is aiming to implant BCI in troopers for several helpful applications.

NEURAL CONNECTION WITH BRAIN CHIP

To know regarding brain researcher's 1st learnt about however neurons are structured and what's the need that we've got neurons and plenty of neural networks. Brain has several areas for each activity we tend to do. The brain functions are dole out by neural networks that collect all the knowledge from every individual cell body with the assistance of neuron and connect one another forming a neural network in brain to method the activities somebody's does. The neural network is joined with brain chips electrically; the conductor sensors of brain chips are accustomed record every signal sent by brain. we tend to can culture brain cells directly on high of chip and very exciting half is that they grow on chip with a decent electrical coupling. It carries out the algorithmic program through totally different networks to attach this we've got synapses within the piece of brain like motor cortex, medulla spinal is and sensory organs. In size of pin hair (as tiny as you'll imagine), over forty million synapses that connect with 30,000 neurons. Nerve cells are messengers between the cells they management algorithm.

USES OF NEURO CHIP

- Movement of paralyzed patients: Brain chip implants helps in interplay of sufferers with computer to study sufferers thinking which helps in computerized movement of paralyzed part. The sufferers with entire paralyzed physique can have interaction through thoughts.
- Telepathy: It is an invisible verbal exchange between two human beings with the use of Genius chip interface. Remote managed animals: These are used for the animals like dog, rat, sharks etc...for army rescue missions. DARPA to neural implants in sharks. The shark's special sensors can make use these implants supplying the records in relation to enemy ship motion or beneath water explosives.
- Robotic Arm: The human beings who go through from physical issues like handicap who are unable to make moves of their physique components can go their palms with the use of robotic arm.

Brain chip implant in soldiers: It can assist solders with intelligence injuries. It's now not been inserted in military soldiers; the scientist has already been searched and tested such gadget into the Genius by way of volunteers. Implanting brain chips in solders will lock all the secrets and techniques of the military missions so when they are caught through enemies the secret data is safe. It will liberate the secrets and techniques of artificial brain and permit us to supply machines the kind of greater stage reasoning that people can do. It can help troopers returning returned to domestic from work with traumatic Genius accidents impacting memory.

CONCLUSION

The invention of mind chip implant era is boon for sufferers with neurological illnesses its revolution in the sphere of engineering and neuro science. Brain chip era which includes verbal exchange primarily based totally on neural pastime of mind. The effects are spectacularly amazing and unbelievable. The gain of mind chips with Nano era will permit researchers for smaller and advanced chips making mind chips era much less burdens a few and extra dependable option for people. More powerful for restoring limbs function of sufferers. Rehabilitations for sufferers. Finally, it has brilliant limitless advantages.

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ETHICAL HACKING: WHITE HAT HACKER

~ Saish Sankhe
~ Tanmay Vedpathak

INTRODUCTION :

As computer technology advances, it has its darker side also; HACKERS. In today's world, the size of the internet is growing at a very fast rate, a large amount of data is moving online, therefore, data security is the major issue. As the growth of the internet increases it has led to an increase in digitization of most of all the processes like banking, online transaction, online money transfer, online sending and receiving of various forms of data, which has led to an increase in the risk of data security. Nowadays a large number of companies, organizations, banks, and websites are targeted by the various types of hacking attacks by the hackers. Generally, after hearing the term hacker we all think of the bad guys who are computers experts with bad intentions, who try to steal, leak or destroy someone's confidential or valuable data without their knowledge. They are the persons with very high computer skills who try to break into someone else security for gaining access to their personal information, but all the time it is not like that. To overcome the risk of being hacked by the hackers we have Ethical Hackers in the industry, who are also computer experts just like the hackers but with good intentions or bound by some set of rules and regulations by the various organizations. These are the persons

A. WHAT IS HACKING?

Hacking is the approach of finding the weak links or loopholes in the computer systems or the networks and manipulating them to acquire unauthorized access to data or to change the characteristics of the target computer systems or the networks. Hacking describes the manipulation of the computer hardware, software, or networks to accomplish certain goals which are not aligned with the user goals. In contrast, it is also known as cracking into individuals' security and stealing their

confidential or secret data such as phone numbers, credit card details, addresses, online banking passwords, etc.

HOW DOES IT WORKS?

A person tries to break into someone's computer systems or network using the bugs and weak links to exploit them for malicious activities in the system. They are also known as crackers, intruders, or attackers. A hacker is a computer enthusiast and specialist in the programming language, security, and networks. He is the kind of person who loves to learn various technologies and details of the computer system and enhances his ability and mastery. According to the way of working or based on their intentions HACKERS can be classified into three groups.

1. White Hat Hackers
2. Black Hat Hackers
3. Grey Hat Hackers

1. WHITE HAT HACKER

A white-hat hacker is a computer security specialist that breaks into and finds loopholes in the protected networks or the computer systems of some organization or company and corrects them to improve security. White Hat Hackers use their skills and knowledge to protect the organization before malicious or bad hackers find it and try to damage the company or the organization's data or steal them. White Hat Hackers are the authorized persons in the industry, although the methods used by them are similar to those of bad hackers, they have permission from the organization or the company who hires them to do so.

2. BLACK HAT HACKER

A Black Hat Hacker is also known as a “Cracker” is a computer hardware and software expert who tries to break into the security of some organization or company with malicious intent or bad intentions of stealing or damaging their important or secret information, compromising the security of big organizations leading of shutting down of company or altering functions of websites and networks.

3. GREY HAT HACKER

A Grey Hat Hacker is a computer hacker or security expert who sometimes breaks the laws but does not have any malicious purposes like the black hat hackers. The term Grey Hat is derived from the Black Hat and the White Hat as the white hat hackers finds the vulnerabilities in the computer system or the networks and does not tell anybody until it is being fixed, while on the other hand the black hat hackers illegally exploit the computer system or network to find vulnerabilities and tell others how to do so whereas the grey hat hacker neither illegally exploits it nor tells anybody how to do so. Grey Hat Hackers represent the white hat hackers who operate to maintain system security and the black hat hackers who operate maliciously to exploit computer systems.

DIFFERENT METHOLOGY OF ETHICAL HACKER

Hacking Can Be Done by Following These Five Phases:

Phase 1. Reconnaissance: It is the set of methods & techniques used to gather information about the target systems secretly. In this, the ethical hacker aims to gather as much information as possible about the target systems. Sniffing the network is another means of reconnaissance and can yield useful information such as IP address ranges, naming conventions, hidden servers or networks, and other available services on the system or network. Sniffing network traffic is similar to building monitoring.

Phase 2. Scanning: Before the attack hacker wants to know what system is up, what applications are used and what are versions of the applications. In scanning, searching all open as well as closed ports is done means finding a way to enter the system. It includes obtaining the target’s IP address, user accounts, etc. In this step, the information

gathered in the reconnaissance step is usedto analyze the network, and tools like Dialers, Port scanners, etc. are used. Nmap is the popular, powerful, and freely available tool used in scanning.

Phase 3. Gaining Control: This is the real part of the hacking approach where the information gathered in the previous two phases is used to enter and take custody of the target system through the network or physically. This phase is also called "'Owning the System".

Phase 4. Maintaining Access: After gaining entry into the system in the previous step the hacker maintains access to the system for future attacks and makes changes in the system in such a way that any other security personnel or any other hacker does not get entry into the system which is hacked. This is the situation in which the attacked system is known as the "Zombie System".

Phase 5. Log Clearing: It is the technique of removing any leftover log files or any other types of pieces of evidence on the hacked system from which the hacker can be caught. There are various tools in the ethical hacking techniques from which a hacker can be caught like penetration testing.

TESTING

The stages for Penetration testing stages are as follows:

- Information gathering - The organization which is being tested would provide the penetration tester with general information needed.

- Reconnaissance- researching about the additional details that can be obtained from any publicly accessible sources, they can identify additional vulnerabilities that might have been overlooked, unknown, or not given.

- Discovery and Scanning- By the information gathered from the first two steps, testers can determine things like port and the services that were available for web applications, targeted hosts or subdomains.

CONCLUSION

This paper provides a detailed taxonomy on the various types of methods that can be used by a ethical hacker for checking various system securities and vulnerabilities. Hacking is basically used to gain unauthorize access to any digital system. After receiving access the hacker can do anything with the data and can also steal it. Hacking done without any permission comes under Ethical Hacking and it is done find system vulnerabilities in a given type of system. Since the technology is it on its way to automation and more advancement than ever before, the fact that cannot be denied that it would be coming with a lot of vulnerabilities and with the help of ethical hacking it can be reduced.

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ETHICAL HACKING: WHITE HAT HACKER

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STARLINK: A SOLUTION TO THE DIGITAL CONNECTIVITY

~ Pratik Patil
~Omkar Adarkar
~ Om Loyare

INTRODUCTION :

The demand of high-speed internet connectivity is in the high demand in the people all over the world due to ongoing pandemic situation [COVID-19] and India is one of the most promising consumer markets of the world. Starlink has given an introductory offer to the customers all over the world including India to have the high-speed internet from the "sky" from satellite, in current situation where all the education and companies are going online for their daily business and there is an acute demand for the high-speed internet connectivity. There is a demand and there is a solution for that, directly from the "sky" but at the same time there are other internet providers like Reliance JIO, Vodafone-Idea, Airtel and others who are into FTTH, Mobile Internet and Internet from Satellite, people are already using Internet but the point of speed of the Internet could be turning point. Another point to ponder the price that is $99 and $499, that could create some hurdles in the market as Indian economy is price sensitive and due to ongoing pandemic situation, many people are struggling to keep up with their jobs. In this research paper the author tries to find out the people view point on the Starlink's introductory offer of providing Internet from SKY and other market condition like competition with already established players in the market.

HISTORY OF STARLINK INTERNET

It is explained below in three phases: PHASE-1 (2014-2017), Although Starlink's development began in 2014, the project was officially announced in January 2015, along with the announcement of a development facility in Redmond, Washington. In Irvine, California, SpaceX constructed a second facility to provide technical support such as signal processing. The corporation applied to the FCC in 2016 to have the new satellite system operationalized. Under the provisions of the

license, an operational constellation of satellites had to be constructed within six years. The name Starlink was trademarked in 2017.

PHASE-2 (2018-2019), Over 7,000 satellites have been approved for deployment by the company, with another 4,000 approved in 2016. Military testing began in 2018 to determine how the networks would work. The United States Air Force awarded Musk's company a $28 million contract for test services in 2019. In June 2019, 57 of the 60 satellites that had been launched into orbit were operational. During this time, the company requested permission from the FCC to change the orbital constellation. One of the goals of this change was to provide more coverage for the southern United States before hurricane season resumed.

PHASE-3 (2020-2021), SpaceX applied to use the E-band in 2020, which would allow for global coverage. In November 2020, Starlink increased its connection speed, and beta testers discovered that the speed exceeded their initial expectations. The first satellites entered polar orbit in January 2021. By June 2021, the company had received 500,000 orders and had nearly 100,000 users. For on-ground networking services, the company has agreements with Microsoft and Google. Additional plans for 2021 included lower-cost next- generation user products.

CLASSIFICATION

Types of ISPs:

- Cable Broadband

Cable broadband connects your home to a local fiber cabinet. However, instead of copper wires, cable broadband connects to the cabinet via coaxial cables, providing a much faster internet connection than traditional copper phone line cables used for 'superfast' broadband connections (up to 60Mbps). So, while cable broadband isn't quite as fast as a full fiber connection, it is significantly faster than FTTC broadband.

- Fiber-Optic Cable

Fiber-optic internet, also known as fiber internet or simply "fiber," is a broadband connection that can achieve speeds of up to 940 Megabits per second (Mbps) with minimal lag time. The technology employs fiber-optic cable, which can send data at up to 70% the speed of light .Furthermore, fiber-optic cables are less susceptible to severe weather conditions than other types of traditional cables, reducing outages. It also effectively resists electrical interference.

- Satellite Internet

A satellite internet connection makes use of a satellite to transmit an internet signal from your internet service. This technology transmits an internet connection from a satellite orbiting the Earth.

STARLINK TECHNOLOGY

According to early public releases of information in 2015, the Internet communication satellites were expected to be in the small sat-class of 100 to 500 kg (220 to 1,100 lb)-mass and to be in low Earth orbit (LEO) at an altitude of approximately 1,100 km (680 mi). In the end, the first large deployment of 60 satellites in May 2019 weighed 227 kg (500 lb), and SpaceX chose to place the satellites at a relatively low altitude of 550 km (340 mi) due to concerns about the space environment. As of January 2015, initial plans called for the constellation to consist of approximately 4,000 cross-linked satellites, more than twice the number of operational satellites in orbit at the time.
According to documents filed with the US Federal Communications Commission, the satellites will use optical inter-satellite links, phased array beam-forming, and digital processing technologies in the Ku-and Ka-bands (FCC). Early satellites did not have laser links. In late 2020, the inter-satellite laser links were successfully tested. The satellites will be mass-produced at a significantly lower cost per unit of capability than previous satellites. We're going to try to do for satellites what we've done for rockets, smaller satellites are critical to lowering the cost of space-based Internet and communications.

FUTURE ASPECTS OF STARTLINK AND OVERALL INTERNET

This section proposes a framework for delivering digital connectivity to remote rural areas via Starlink. As an example, the proposal considers an off-grid location. It is easily adaptable to a grid-connected location. Given that students receive content the majority of the time during a remote learning session, it is thought that 2 Mbps download speed and 0.25 Mbps upload speed is adequate for a reasonable remote learning experience. Delivering remote learning sessions, the numbers listed above are feasible.
Given the average download throughput in Table 1 above, a single Starlink CPE can support multiple simultaneous connections. However, when the average upload speed is taken into account, a single Starlink CPE can only support 68 simultaneous connections. Allowing for any performance fluctuations, it is reasonable to assume that access to 50 devices can be provided concurrently through a single Starlink CPE to provide a reasonable remote learning experience using current technology. With 50 concurrent users, each user will have a download speed of more than 3 Mbps and an upload speed of more than 0.3 Mbps. Figure 3 depicts a concept for a rural off-grid digital connectivity center. Internet access is provided by Starlink in this facility, which is powered by solar energy. Let's start with an approximation of the power requirement. Assume thatthis center has 5 desktop computers and 5 laptop computers. In addition, 40 tablets can be used at the same time in this location. The physical structure of the center may be built specifically for the purpose, or it may be a repurposed existing structure.

CONCLUSION

There are no doubt that low-Earth orbit satellites, particularly Starlink, will transform global broadband connectivity. Starlink will be a game changer as the standard for internet connectivity is raised. Communities that want to achieve long-term digital equity, on the other hand, should keep working to build future-proof terrestrial broadband infrastructure.

STARLINK: A SOLUTION TO THE DIGITAL CONNECTIVITY

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GOOGLE GLASS TECHNOLOGY

~ Manas Mhatre
~ Prasad Naik
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INTRODUCTION :

Google Glass is a wearable, voice- and motion-controlled Android device that resembles a pair of eyeglasses and displays information directly in the user's field of vision. Google Glass offers an augmented reality experience by using visual, audio and location-based inputs to provide relevant information. Nowadays, most of people have a smartphone, a tablet, a laptop, or other device. So it can be said that the web is a powerful tool in society for many uses such as informative, social, as well as entertaining. Therefore, with the introduction of Google Glass, a new idea of internet usage has arrived. The truth is that these glasses are quite beneficial to the society in numerous ways, including public safety, social sharing, innovative educational as well as research methodologies, and improved communication. The public can become an important factor in reducing crimes with the use of Google Glass. Glass is fast and easy because it is hands free. For example, upon entering an airport, a user could automatically receive flight status information.

HOW GOOGLE GLASSES WORK

The Google Glass operating system (OS) is based on a version of Android. The OS can run application Virtualization tool called Glassware that are optimized for the device. Glassware allows the device to deliver an app to the user, instead of a full desktop. The glasses have built-in Wi-Fi and Bluetooth connectivity and a camera for taking photographs and videos. The smart eyewear uses motion and voice recognition to process commands from the wearer. A touchpad is also available on the glasses' rim. To provide the requested information, the device relies on sending small packages of information straight to the wearer through a micro-projector, using a private channel of communication that can only be accessed by the user.

TECHNOLOGIES USED

A. Wearable Computing:
It is an electronic device that is worn by the bearer under, with or on top of clothing. This technology have reduced the time of action and intention for example, as Google suggests possible search options on inserting few initial letters in the search box.

B. 4G technology:
4G technology is fourth generation of mobile communication technology. A 4G system provides ultra broadband internet access for example, laptop, wireless modems also smart phone. It provide Data security for mobile devices, computers.

C. Android Operating System:
Android is mobile operating system consist of the Linux base OS. It is developed by Google. Almost every smart phone now a days is designed on Android operating system .

D. Eye tap:
Eye tap is head mounted display which acts as camera for recording pictures and scene present in front of eye. The image is reflected digital Camera (eye tap) this image is captured and send to the computer. It simply the capture image and scenes to use eye tap.

DESIGN

A. Video Display:
Its options with the tiny video display screen that's display the crop up hands free data.

B. Camera:
It additionally has the front facing video camera with that photo and video is taken in it.

C. Speaker:
Google glasses are designed to be hands free wearable device which will be build or receive calls too. Therefore a speaker is additionally designed by the ear.

D. Button:
A single button on the spect of the frame the glasses to figure with the physical bit input.

BENEFITS AND LIMITATIONS

Benefits:

- Easy to wear and use.
- Google glass responsive and sensitive to presence of people.
- It provides fast access of maps, videos, chats, documents and much more
- It is a new trend for fashion lovers within an innovative technology.

It is a useful technology for handicapped and disabled people.

Limitations:

- Users wearing spectacles won't be able to wear Glass.
- Privacy of people may be violated with Glass
- Glass shows data in front of user's eyes. So it will be a tough experience for him/her.

FUTURE ASPECTS

In future, Google glasses are going to be used world wide as a tool for maximizing the efficiency of humans. It will be a great tool to use as time will be less required for any work to do. This Google glasses are very useful in almost every domain or every sector like mostly the education sector, business sector, medical sector, etc. This will also help in upcoming Metaverse World, it's basically a virtual place to explore things and to buy and sell anything.

CONCLUSION

Google Glasses are wearable computers which use the familiar technologies. It provide ease of communication and information access even for the physically challenged class of people who cannot use palmtops and mobiles.

GOOGLE GLASS TECHNOLOGY

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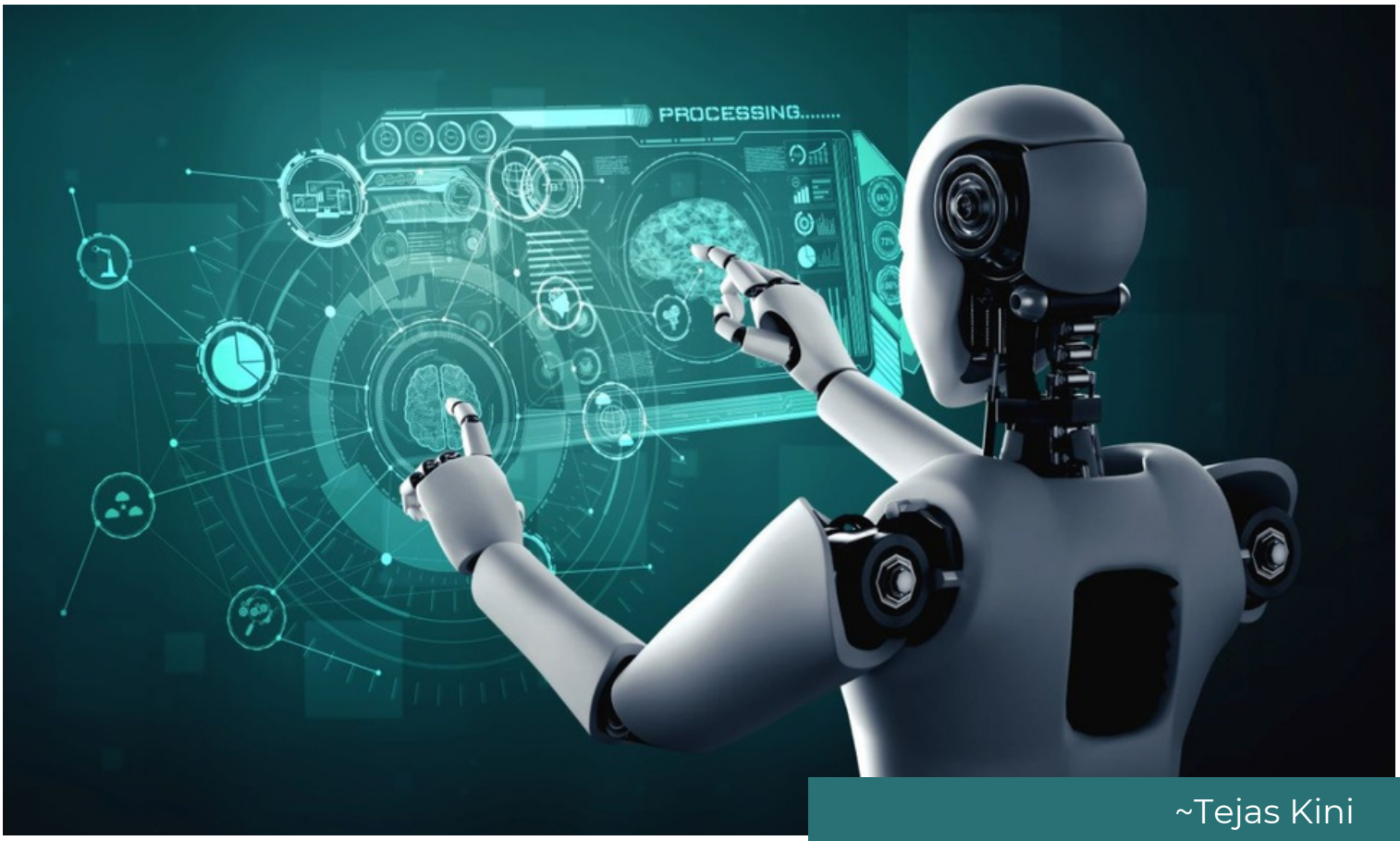
ROBOTIC PROCESS AUTOMATION AND ARTIFICIAL INTELLIGENCE IN INDUSTRY



~Tejas Kini
~ Nikita Shinde
~Tanisha Motivaras

INTRODUCTION :

Robotic Process Automation and the most commonly known as a 'RPA' is a new age technology that help all of us to performed tedious task with ease. RPA is a combination of Artificial Intelligence and automation. Today we all see in the largest majority of services are provided by the companies and institutions as digital services. Robotic Process Automation has the vast of advantages in term of the automating organizations and business processes. Taking into account the technological evolution of the last decades and the proliferation of information systems in society, today use of Artificial Intelligence (AI) algorithms and techniques allows to improve the accuracy and execution of RPA processes in the abstraction of information, in the reorganization and classification, forecasting and optimization process.

RPA is a business automation technology used to automate the repetitive tasks that are time consuming. By using this automation time taken by task is reduced and the rate of productivity increases.

ROBOTIC PROCESS AUTOMATION

In today's world Robot Process Automation(RPA) is an useful and an established technology. It is based on Machine Learning and Artificial Intelligence (AI) which uses numerous computer code robots to perform a business destined task. Formerly, in many organizations large volume of data was dealt by humans itself. But, now with the help of RPA it is easier to perform any task which can be difficult for humans to handle.

RPA contemplates the continual actions performed by users then automation is finished on those tasks directly in GUI. It allows the organization to give frequent tiresome admin work over to the machines which can handle it well and in obedience.

AUTOMATION

Artificial intelligence (AI) is that the ability of a computer or a automaton controlled by a computer to try and do tasks that are usually done by humans as a result of they need human intelligence and discernment. It can also be defined as a wide-ranging branch of computing involved with building good machines capable of activity tasks that generally need human intelligence. The birth of the unreal intelligence language was denoted by Alan Turing's seminal work, "Computing Machinery and Intelligence" that was printed in 1950.

Artificial Intelligence is the science and the engineering of making intelligent machines. Artificial Intelligence is the technique of getting machines to work and behave like a humans. In recent past AI has been able to accomplish by creating machine and robots that are being used in a wide range of fields including Healthcare, Robotics, Marketing, Business Analytic and much more. For it all the instance have we ever wondered how google is able to give such accurate search results and the Amazon always gives us favourite content based on the interest and the answer of this question is the Artificial Intelligence.

“The general definition of Industry 4.0 is the rise of digital industrial technology Industry 4.0 transformations allow us to work alongside machines in new, highly productive ways”[2]. The fourth technological revolution and also the impact of the drivers and technologies behind trade 4.0 are checked out from the angle of assorted sectors when the conception was launched. Industry 4.0, that encompasses IOT and sensible producing, marries physical production and operations with sensible digital technology, machine learning, and massive information to make an additional holistic.

WINAUTOMATION

WinAutomation (website) could be a powerful and straightforward to use Windows-based computer code tool for building computer code Robots. These computer code Robots can alter all of your desktop and web-based tasks with zero effort. This tool is employed on the windows machine to alter repetitive tasks. This tool will produce AN surpass file, scan the info within the surpass file and write the info within the same surpass file. It will produce files, delete copy, etc. on a windows machine on its own. It will virtually operate the full windows atmosphere on its own. This tool also can be accustomed alter net applications, however during this tutorial, you may see however it works with a windows application. It will fill net forms, extract knowledge and transfer identical knowledge from one application to a different. If the required task isn't completed with success by this tool, then it'll send you an automatic email. You’ll be able to instruct it to create a call as you'd simply do. All the tasks or problems will be controlled simply by WinAutomation tool rather like however an individual's will. This tool Automates: Windows Application & Web Application.

FUTURE SCOPES OF RPA

The future scope of RPA is discovered within the field knowledge of information entry and data rekeying jobs. These tasks may be simply machine-controlled with RPA. the varied repetitive tasks like information, information grouping or something which needs a series of steps area unit simply dispensed with the assistance of RPA. the opposite computer-supported processes that utilize a group of procedures also are performed through RPA. RPA is a new age technology that help us in the future to make work faster and time saving.

CONCLUSION

This document presents an investigation on the Robotic Process Automation with Artificial Intelligence. It was based on the analysis of information researched in digital libraries on the webs as well as in the scientific digital libraries. A proprietary tools (UiPath, Kofax, Automation Anywhere and WinAutomation). On the other hand, Industry Revolution we are experience today. Lives on the fusion of the Internet of Things, Intelligent automation, devices and processes and the Cyber-physical System. This all the concept working together and technologies brings a significant change in Industry as well as workflow of digital processes throughout the company. Nowadays RPA is used in many tools as we show in this paper, which reach the levels of intelligence in the automation of processes within a Industries.

ROBOTIC PROCESS AUTOMATION AND ARTIFICIAL INTELLIGENCE IN INDUSTRY

TECHNEXT 2022

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FUTURE AUTOMOBILES

~ Anuradha Dhumwad
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INTRODUCTION :

Technology is constantly growing with its new invention in every domain whether it be with software, automobiles, management systems, finance, etc. The automobile industry has been increasingly developed for people as they desire a convenient vehicle as well with lavish facilities. The future of automobiles has already started with an electric car coming into the road, focusing mainly on environment electric cars are the best resource as due to technology the only thing affecting is environment, the future has to think of everything. Modifying electric cars inner-out there are many points that we can discuss on to as well the engineers are focusing on some points to come in play. Say it having driverless cars, biometric insides, having hyper connectivity functions for managing traffics, and AI/ML system within it. Considering, the evolution of vehicles we can get big data analytics platform to get optimized parts and giving the original manufactures a qualitative advantage in an intensely competitive market. The advancement in technology not only attracts the end users but also the economy of the country or the shop changes with its approach.

HISTORY OF FUTURE AUTOMOBILES

1. PAST TIME

Over the year, if we look back into the system of transportation where there were horses and bullock carts being used for travelling from one place to other was quite inconvenient and exhausting. With times we have seen many changes in this world with that there are automobiles a field of interest for everyone. We have seen different companies evolving their vehicles we can see for example the first model of ford.

2. AT PRESENT

Now technology has taken its speed as we all know but the speed in the automobile sector has been seen rapidly, we see at present automobile models getting upgraded day by day. Number of companies exploring what new to be done to upgrade their model and make it more attractive to the customers. We see Mercedes, BMW, AUDI, RANGE ROVER and many more in the top list having many functionalities inside-out. TESLA being dominant in the market of electric cars which is the future of automobile industry has proved us that with technology we can dream big for automobiles as well.

GROWTH OF AUTOMOBILES

If we look up to the past experience and the overall advancement of the automobiles, it's safe to say that we have come a long way with it. According to the research, the Global Automotive Market consisted of 85.32 million units in 2020, and to be reach 122.83 million units by 2030. The industry is expected to grow at a CRAR of 3.71% from 2020-2030. Automobiles has been in requisite of economic benchmark. The uniqueness and the costly features are eye catching to the modern era. High efficiency, low level running cost of engine is giving industries to grow on every possible way to give customer the level of satisfaction. Considering from modern perspective, these combustion engines shall remain dominant until say a decade. More the people are spending on the luxury car the more will be demand for fuel efficient and lightweight vehicle and market growth. Germany holds leading pathway to automobiles and advance technology followed by many other countries. For instance, if we look into India's automobile sector, there recent program named- The Automotive Mission Plan has set a target of increasing the vehicle sector's contribution to national GDP to 12% and creating around 50 million new employments. Covid-19 impact: This pandemic has hit every sector critically including automobile industry, the manufactures of had faced issues such as cut down on their production output.

BARRIER TO IMPLEMENTATION

A) Cost:
companies spending huge amounts on making their vehicles unique with updated features. Accordingly, the market price increases and it becomes hard for the common people to purchase it. Expecting once the technology is proven it may come down to half of its price which is still going to be the very huge amount for a normal person.

B) Technology Challenges:
Almost many companies have announced that they will be having partial autonomous features in their vehicles but the challenge might be people adapting those technologies. At some country it's even based on the road conditions and their public for example, if we take INDIA and its traffic situation an autonomous car might be hard to rely on. Also, the condition of roads is not that good for an electric car with autonomous features.

C) Unemployment Issue:
Although having an autonomous vehicles have numerous benefits but focusing on the unemployment of the drivers. Once if people rely on the autonomous vehicles there will be no need of any drivers. This may affect the survival of the people having a livelihood of professional drivers. This might be a huge problem faced.

D) Security And Privacy
Introducing biometrics, we can make sure that the vehicle is secured. But as technology has its growth in various sectors there's hackers around and they might jeopardize vehicle system which is fully autonomous. Also, as this vehicle will be connected through GPS anyone can get the position and it can be used to any kind of bad purpose.

CONCLUSION

Automobiles will continue to grow in the coming time and it will bring number of benefits to the society, less pollution, more safety, shared economy and many more. Some of our greatest minds are investing and joining forces with the automobile sectors in order to improve and operates these days and taking a step closer to the digitized environment. Development in this sector will increase the global shares as well opportunities for the automobile engineers. There might be unemployment issues as we have discussed in this paper, accidental, traffics and many more issue might now be solved with this autonomous functionality. It shall take some time for the people to adapt this technology but sooner will get used to it. Focusing on how our present technologies are getting advanced, it is a short way to achieve the possibilities mentioned above.

FUTURE AUTOMOBILES

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CYBER SECURITY

~ Komal Shirsath
~ Krupashree Sawant
~ Ankita Yadav

INTRODUCTION :

In today's time, almost all the activities of day-to-day life is totally depending on internet. Many people communicate with one or the other people for multiple purpose through internet. People entertain themselves, conduct financial transactions, and accomplish work related task on daily basis. These activities we do by taking aid of internet. Internet is considered to be the place which is private and secure. But it is not completely safe medium for sharing information. So, now, by considering the above condition, cyber security is a top priority for an individual or any business person. Now a days, all devices are connected to each other by IoT technology. These devices generate data throughout the day. There is a threat of stealing and misusing the device generated data. Essential services like hospitals, financial service company, power plants etc. collects personal data of users and store them in storage. Multi-national companies always have a number of tasks daily in which, they share important information through the internet. There is a threat of misusing the information. There is always a threat of misuse of these sensitive data, loss of data. These attacks are in such a way that they cannot be stopped by anyone. So, due to all these things, Cyber Security concept is taken into consideration by all the individuals and business companies. Cyber Security can be defined as the technique by which the computing system or any other system can be secured from any illegal or unauthorize use of electronic data. Cyber Security is referring to the body of technologies and it is also a technique of protecting networks, computers, programs and data from unauthorized access or attacks. The aim of cyber security is to confirm the privacy of information, correctness of data and access to authorized use. The word "Cyber Security" is divided into two words i.e., "Cyber" and "Security". Cyber means the technology which consist of systems,

- Network security: Network security basically contains address vulnerabilities. These vulnerabilities make an effect on operating system and network architecture. This architecture consists of servers and hosts, firewalls and wireless access points and network protocols.

- Cloud Security: Cloud Security is also known as Cloud computing security. It is defined as the collection of rules of security which are designed to protect the cloud infrastructure , application and data. These protocols ensure authentication of user and device, protection of data privacy, control of data and resource. Cloud Security bothers about the security of data, applications and infrastructure which is located in the cloud. It is deployed in cloud environment for the protection of data of the company from DDoS attacks, malware attacks, hackers or any unauthorized use or access of user.

- IoT(Internet of Things) Security: IoT Security basically takes securing smart devices and networks which gets connected to the internet. These devices consist of the things which gets connected to the internet without any human interference. This includes smart fire alarms, lights, thermostats and many other appliances.

- Application Security: Application Security contains addressing damages which results from the process of insecure development .It is used in processes like designing ,publishing and coding of any software or a website.

CYBER ATTACK

A Cyber-attack is the technique or process in which an attempt like attempt to disable computer system, steal data or making use of any breached computer system for launching additional attacks. The attacker which attacks is generally termed as “cybercriminal”.

The cybercriminal use different methods for launching of any cyber-attack. These cyber-attacks generally contain malware , viruses ,phishing, ransomware ,or any other method. Generally, in cyber -attack, the attacker tries to get the illegal access of the electronic data which is stored on computer or any network. Basically, cyber-attacks target to an individual, groups, organisations or government.

CONCLUSION

Cyber Security is one of the greatest concerns of today’s time. It acts as a tool in preventing the cyber-attacks. It is a vast concept. So, it gets evolved as the day passes. There are many tools invented by which we can prevent the system from any sort of attacks like attack of viruses, worms etc. Many product- based companies takes the surveys of the people for increasing their profits. These data are travelling from one place to another through internet. So, for safeguarding these data, Cyber Security is at higher priority. Cyber Security ensures the privacy of data of an individual by keeping it safe from any kind of cyber-attacks. By following some techniques, we can save our data from getting into the contact of a person who can make misuse of it. New techniques of attacks, new viruses will be introducing to all the world in the next few decades. So, the level of Cyber Security will be increasing day by day.

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ANEUTRONIC FUSION

~ Amarjit Vishwakarma
~ Santosh Pal

INTRODUCTION :

Effective way of producing high energy with clean source have very few process. One of the process or solution is aneutronic fusion . Aneutronic fusion is a fusion of elements in which neutron byproduct is absent so there is clean source of energy for surrounding and relief from Radioactive byproduct. In aneutronic fusion various elements are involve which provide clean source of energy for surrounding i.e Boron +proton and Helium3. In this fusion by product are proton so it will not make surrounding to Radioactive or poisonous. Various organizations are involved to achieve this fusion as this is a future scope. In this, proposed method may work accurately or help to achieve desired results.

For development of human being we required a lot of energy but it should be clean and not making impact on earth long time. Achievements of neutronic fusion will give relief from a problem of nuclear radiation ,neutron ionizing radiation. however it is simple to take energy from charge particle as compare to uncharged particle i.e neutron . Reaction will going to replace Neutron from Proton to activate atom in excited state . Aneutronic fusion is very helpful in space exploration mission in solar system these gives very high speed to spacecraft up to 52-55 km per second with specific power of 0.77W/kg and engine produce up to 20 N of thrust here energy emitted by the fusion reaction is n less than 1% ,here n is neutron Total energy emitted by neutron fusion ,only Helium ion is released by reaction. However situation required to harness aneutronic fusion are much more critical than required for Deutritium and Tritium fusion. Here the rate of operation is directly proportional to a nuclear cross section. If we analyze any fusion device has maximum plasma pressure then any other economical device so largest fusion output is obtained when temperature is chosen i.e

<σv>/T2is provided maximum energy . The value of triple product nTτ required for ignition is minimum so the required fuel is inversely proportional to <σv>/T2 .Ignition of Plasma is only possible when fusion reaction produce enough energy to maintain temperature without external body heating. Deuterium and tritium fuel have highest nuclear cross section which means the reaction rate will be much more than any other fuel. Thus it shows D-T fusion is easiest to achieve and one can compare the potential of other fuel by comparing of D-T fusion .The table specifier and compare fuel with DT reaction.

1. POWER BALANCE

The peak reaction rate of p–11B is merely one third that for D-T, requiring higher plasma confinement. Confinement is typically characterized by the time τ the energy should be preserved so the fusion power discharged exceeds the facility needed to heat the plasma. varied necessities will be derived, most ordinarily the merchandise of the density, nτ, and also the product with the pressure nTτ, each of that ar referred to as Lawson criterion. The nτ needed for p–11B is forty five times on top of that for D-T. The nTτ needed is five hundred times higher.[8] (See additionally neutronicity, confinement demand, and power density.) Since the confinement properties of standard fusion approaches, like the chamber and optical device pellet fusion ar marginal, most aneutronic proposals use radically totally different confinement ideas. In most fusion plasmas, bremsstrahlung radiation could be a major energy loss channel. (See additionally bremsstrahlung losses in quasineutral, identical plasmas.) For p–11B reaction, some calculations indicate that bremsstrahlung power are going to be a minimum of one.74 times larger than the fusion power. While megatesla fields haven't nonetheless been achieved, fields of zero.3 megatesla are created with high intensity lasers, and fields of zero.02–0.04 megatesla are discovered with the dense plasma focus device. At abundant higher densities (ne > six.7×10-34 m-3), electrons are going to be Fermi degenerate, that suppresses bremsstrahlung losses, each directly and by reducing energy transfer from ions to the electrons.

2. Fusion Engine

Wonderful progress has occurred within the initial 3 areas. In 2010, TriAlpha Energy corporation rumored close to classical energy confinement time in their FRC. (The "classical" price for confinement time is predicated on Coulomb-collision-driven diffusion. The confinement time of a true plasma is a smaller amount than the classical limit, generally dramatically so.) Our engine desires energy confinement solely 1/5 as giant because the classical price, although at significantly higher plasma temperature. In 2007, associate degree RMFo-heated FRC achieved stable plasma durations 3000 times longer than expected by MHD theory. Finally, theoretical studies indicate that RMFo are going to be able to heat plasma electrons and ions to fusion relevant temperatures. These area unit promising starts, but much research is required at higher plasma temperature and density and with burning, i.e., fusing, plasmas. Fusion ameter. A smaller volume interprets to a proportionately lower power, near 10 MW, appropriate for a module-based propulsion system. One characteristic of the RMFo RF method — thanks to a constraint set by the RMF-generated current and therefore the FRC's field strength is that the required RMFo frequency, ωRMF, decreases because the product of plasma density times the sq. of the plasma radius. In distinction, the utmost particle energy is proportional to ωRMF. Thus, large or dense associate degree FRC isn't well heated.

3. .FUEL SYSTEM

The fuel system consists of the refrigerant tanks, the propellant lines and therefore the fuel heat. The rotating field heat generates RF power somewhat below the 3He particle accelerator frequency ωic = zeB/m(4) where z is that the variety of electrons per atom, B is the magnetic field e is that the elementary charge and m is that the mass of the particle. This field is revolved regarding the

long axis of the reactor at a frequency zero.1 to 0.01 times ωic. The ion-cyclotron frequency for 3He is thirty.57 Mc in a very three T field. this can be within the shortwave (HF) communications band.

4. MAGNETIC COIL

The magnetic coils area unit separate coils house on the length of the reactor. The radii of the magnetic nozzle coils area unit smaller than that of the FRC coils. An example of the layout. every coil encompasses a cooling jacket before the lithium binary compound shielding and solely a tiny low quantity of heat is removed victimisation the cooling system.

5.FUTURE ASPECTS OF ANEUTRONIC FUSION

Aneutronic fusion having huge scope in energy generation. As population and pollution is increasing day by day so we required clean and huge source of energy generation where aneutronic fusion full fill this requirement. Various International organizations involved and researching on it since very long time to implement this method. This also make possible for huge space mission and does not give any nuclear by product on surface of other planet in Solar System , so in future it can use in large scale in spacecraft propulsion system. It can also provides very high speed to spacecraft .It can also make interplanetary mission possible in limited time.

CONCLUSION

Thus, we have presented the design for Fusion Powered reactor and fusion engine. In which deterium and tritium are fuse with each other to form aneutronic fusion reaction and gives clean source of energy in which ,n is less than 1% here n is neutron. Here we had also presented aneutronic fusion powered engine which gives the clean source of energy and does not provide any nuclear by product and we can prevent neutron activation of surface of any other planet on solar system .we had achieved due to FRC (field rewards configuration)using deterium 3 Helium reaction as energy source. This engine is design on basis of longer mission .This engine have a lower mass ratio which other existing engine cannot achieve this state.

ANEUTRONIC FUSION

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REGULARIZATION IN DEEP LEARNING

~ Poonay Kuchekar

INTRODUCTION :

In Deep learning or ML, we face the problem like overfitting. This issue occurs when our model hasn't trained well or maybe our model is extremely trained well so it doesn't give accurate result on test data (i.e new inputs). Thus the main reason behind is bias and variance. In training dataset if the model doesn't gives error and it classifies very well but in validation set it fails to generalize and classifies so then this overfitting will occur. Thus the data used for validation set will be different from training set. If the error on training set is 1% and validation set is 11% then it is said to be high variance as model is able to do well on trained set but fails to do well in validation set. On other hand if the trained set error is 14% and validation set error is 32% this means this model has high bias and high variance , it doesn't perform well on trained set neither on validation set. Thus to overcome this, we will use regularization. Regularization helps to eliminate certain parameters or neurons in neural network to obtain smooth curve as overfitting is caused by having too complex curve or a linear curve. In regularization we will deeply study about its two techniques i.e l2 regularization and dropout regularization.

1. REGULARIZATION

The subset of Artificial Intelligence is Machine Learning and Deep Learning. In this the models are trained, validated and tested. When the model is extremely trained or doesn't give good result in validation test or gives good result on trained set but fails to give results on test dataset so this is called as overfitting and underfitting and to solve this, Regularization is used. Since Deep Learning (DL) is a subset of AI and ML (as shown in fig1) so Deep Learning is used to correct the small errors as well as to train the model perfectly constellation to consist of approximately 4,000 cross-linked satellites,

more than twice the number of operational satellites in orbit at the time.

According to documents filed with the US Federal Communications Commission, the satellites will use optical inter-satellite links, phased array beam- forming, and digital processing technologies in the Ku- and Ka-bands (FCC). Early satellites did not have laser links. In late 2020, the inter-satellite laser links were successfully tested. The satellites will be mass- produced at a significantly lower cost per unit of capability than previous satellites. We're going to try to do for satellites what we've done for rockets, smaller satellites are critical to lowering the cost of space-based Internet and communications. Because SpaceX is a new entrant in the satellite communications market, SpaceX asked the FCC in February 2015 to consider future innovative uses of the Ka-band spectrum before committing to 5G communications regulations that would create barriers to entry. SpaceX's non-geostationary orbit communications satellite constellation will operate in high-frequency bands above 24 GHz, where steerable Earth station transmit antennas would have a wider geographic impact, and significantly lower satellite altitudes magnify the impact of aggregate interference from terrestrial transmissions. The minimum theoretical round-trip latency for Internet traffic via a geostationary satellite is 477 milliseconds (ms between user and ground gateway), but current satellites have latencies of 600ms or more. Starlink satellites are orbiting at 1 /105 to 1 /30 of the height of geostationary orbits, and thus offer more practical Earth-to-sat latencies of around 25 to 35ms, comparable to existing cable and fiber networks. The system will employ a peer-to-peer protocol that is said to be "simpler than IPv6," as well as native end-to-end encryption. For orbit raising and station keeping, Star link satellites use Hall-effect thrusters with krypton gas as the reaction mass. When compared to a similar electric propulsion system operated with xenon, krypton Hall thrusters exhibit significantly higher flow channel erosion, but krypton is much more abundant and has a lower market price.

TYPES OF REGULARIZATION

1. L2 REGULARIZATION

The L2 regularization is the most common type and is also commonly known as weight decay or Ride Regression. This regularization strategy makes the weights closer to the origin by adding a regularization term $\Omega(\theta)=\mathbf{1}\ ||w||\mathbf{2}$

2. L1 REGULARIZATION

The L1 regularizer introduces sparsity within the weights by forcing more weights to be zero rather than reducing the typical magnitude of all weights (because the L2 regularizer does). That is, L1 suggests that some features should be discarded from the training process.

$\Omega(\theta)=\Sigma|w|$

3. DROPOUT REGULARIZATION

This technique is used in deep learning to overcome overfitting. In neural networks there are many hidden layers and every input and output has connected weight. Sometimes the neurons can be bias due to specific feature. So due to dropout the neurons are randomly eliminated and maybe those neurons are also eliminated on which the output neuron is dependent on. So this gives an solution for overfitting.

4. EARLY STOPPING

In this method, we can control or stop training phase on several condition. In early stopping when the model tries to overfit after a certain point or epochs then it stops fitting the data. The process of stopping training when we have increase in validation loss this is known as early stopping.

CONCLUSION

The overview of this paper is to study and know about regularization and how it actually happens. The main thing to focus is on bias and variance. The L2 or Ridge Regression is for predicting values through weight. In both techniques we have to introduce little bias as introducing this little bias can give error in training set but can overcome through error in testing set. Thus, the regularization gives us additional information about to use the smaller weights, the parameters sharing is useful.

To prevent the overfitting limit the model capacit

get more data to avoid high variance issues. We can also use regularization on random forest or decision trees. Also, Data Augmentation is a part of regularization. It is used for imaging tasks where the images can be rotated, mirrored, translated, scaling, added random noise etc. It is also useful in speech recognition too.

Cyberwarfare is not a future threat—it's a clear and present danger. While the concept of cyber terrorism might sound like something from a fictional movie, our interconnected world is riddled with security flaws that make it an unfortunate reality

REGULARIZATION IN DEEP LEARNING

TECHNEXT 2022

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MY INTEREST IS TO LEARN AND RESEARCH ABOUT MACHINE LEARNING AND DEEP LEARNING ALGORITHMS AND APPLICATIONS.

PRIVACY ENHANCING COMPUTATION

~ Jayant Pramod Varma
~ Abhishek Pramod Ojha
~ Kishore Pitamber Jha

INTRODUCTION :

According to the recent research, 27% of internet users do not provide their correct details while registering or accessing a website or any other services on internet. The major cause of this phenomenon is the trust factor.[3] People of this information age do not trust the modern privacy technologies. It is because the increasing cases of digital crimes over the internet such as digital theft, identity theft, financial information leaks, personal and important data leaks, cyberattacks, etc.[1] People are mainly concerned about important and personal data as they find difficult to track the access and usage of their data. This increases violation of potential of citizens' privacy.

Data is at the core of all organizations, the most valuable asset in this information age. As its value keeps on increasing, keeping this asset safe becomes the highest priority for stack holders and individuals. Information needs to be valuable insights. However, considering the large volume of data that needs to be safeguarded for privacy, data governance and technology integrations, the task becomes herculean. Though there are privacy legislations around the globe, privacy breaches occur very often. The third-party involvement in transactions is the main cause of this happenings.

To increase the privacy of the data Privacy Enhancing Computation (PEC) provides variety of Privacy enhancing technologies which helps people to keep their privacy of sensitive data. The use of privacy-enhancing computation (PEC) has become a crucial security measure for stack holders of privacy security. PEC adopts the technologies like AI, organizations today can process increasingly complex and growing data in a structured, controlled, and protected manner.

Privacy Enhancing Computation (PEC)

Privacy Enhancing computation secures data in use while maintaining the privacy and secrecy of it. By analysis and researches, it is found that, by 2025, the implementation of privacy enhancing computation in large organizations will reach up to 50% [4]. For processing the data in untrusted environments and multiparty data analytics use cases.

This kind of security comes mainly in three types:

Type 1: It provides trusted environment for processing or analysis of data through third-party and hardware-trusted execution environments.

Type 2: In this type, PEC concerns decentralised processing and analytics through federated or privacy-aware machine learning.

Type 3: This type, transforms data and algorithms before processing or analytics, including zero-knowledge proof, secure multiparty computation and homomorphic encryption.

Privacy Enhancing Technologies (PET)

Some of the Privacy Enhancing Technologies (PETs) are:

1. Homomorphic Encryption:
Homomorphic Encryption is a technology which allows the processing of encrypted data for third-party providers. Data in this technology can only be decrypted and accessed by specific individuals having particular keys.

2. Muti-Party Computation:
Secure Multi-Party Computation is cryptographic protocol. It allows individuals to work together in computing functions over their inputs without revealing them individually. This means variety of data can be analysed without violating privacy. Parties involved in shared computing do not have tracking of performance of other parties.

3. Zero Knowledge Proof:
Zero-Knowledge Protocol (or Zero-Knowledge Password Proof, ZKP) involves authentications where no passwords are exchanged. This makes communication more secure. In this only true information is shared, without revealing anything else. In a transaction using zero knowledge proofs, the analyzer attempts to prove something to the verifier without telling the verifier anything else about that thing

4. Differential Privacy:
Differential privacy is an algorithm which allows info about datasets to be shared without leaking the identities of individuals and organizations in computing environment. It is a powerful tool for quantifying and solving practical problems related to privacy.

CONCLUSION

In this paper, the overview of Privacy Enhancing Computation is presented. The variations of modern privacy enhancing techs provided by PEC. The technologies such as Homomorphic, MPC, DP, etc helps organizations to manage and analyse data more securely specially in terms of privacy of data.
With help of more detailed and focused study of the presented technologies more advanced technologies can be extracted and launched.

PRIVACY ENHANCING COMPUTATION

TECHNEXT 2022

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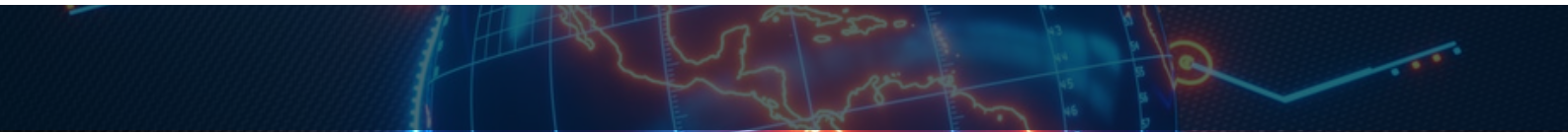
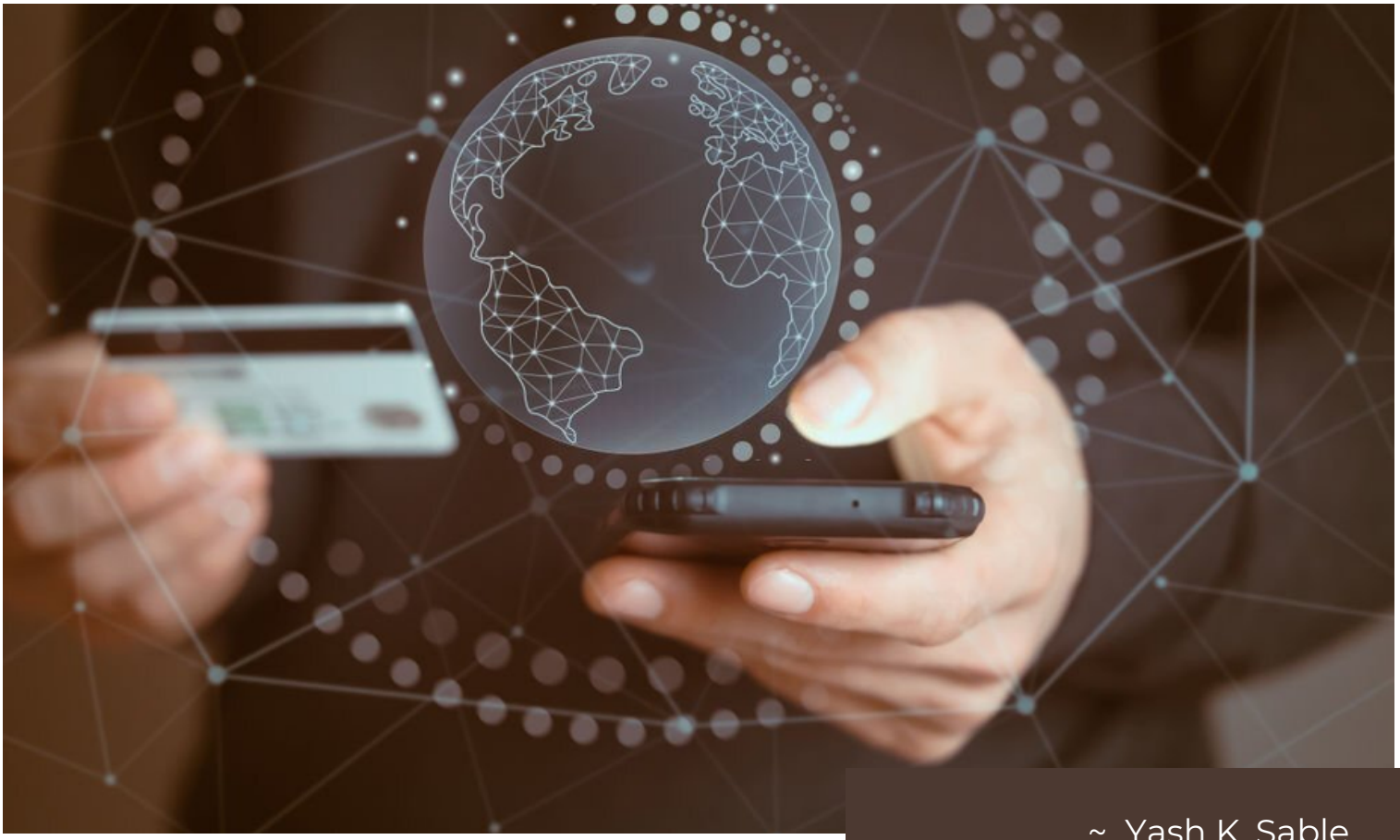


UPI – THE NEED, INVENTION AND USE OF UNIFIED PAYMENT INTERFACE FOR QUICK AND CONVENIENT TRANSACTIONS.



~ Yash K. Sable

INTRODUCTION :

Flashback to the Great Indian Demonetization, since when online transaction system was the most sought after technology. The use of portable devices and Internet have made things easy, convenient, organizable and quick. One such among them was 'UPI' system or Unified Payment Interface under the Initiative of Digital India by NPCI (National Payment Corporation of India). More efficient and User-friendly, Legal and Transparent, where every transaction can be tracked and recorded. Its Exponential Growth in the Pandemic Period were people choose cashless payments. Used by Millions but the technology behind it known to few. We will be tracing back its history for knowing more about the Pre-UPI era, its drawbacks as of now and also development of innovative solutions for consumers and businesses

In This era of Technological Advancement, where saving time is the need of hour. We have alternatives for almost everything which reduces the Time and complexity of a particular task. Money Transaction was one such thing which was both Time Consuming and Complex in terms of usage or interface.It was the year 2016 when Indian market was introduced to a Simple Yet Helpful Technological Alternative to Bank Transactions. Named Unified Payment Interface (UPI) by National Payments Corporation of India (NPCI) which was established by the Reserve Bank of India (RBI)

and Indian Bank's Association (IBA) who already developed systems such as National Financial Switch (NFS) and Cheque Truncation System (CTS) in order to develop a strong transaction infrastructure and bring Efficiency, Uniformity and Transparency in Transactions adding to a revolution in Digitalization. UPI is a member technology of Stack India, a group of indigenous API's and Tech Goods that are open to public which aims to unlock the economic primitives of payment Methods. UPI is a real-time payment platform or an Upgraded version of IMPS (Immediate Payment Service) developed indigenously in India, where one can send or receive money using VPA (Virtual Private Address) without revealing or entering any bank detail for which a user must have a bank account at first. It works on the principle of Open API. API which stands for Application Programming Interface is a tech that allows us to connect multiple computers or computer programs to each other and also for abstraction of unnecessary details on the Client Side. Hence what we get is an easy to use

MAKING YOUR FIRST UPI TRANSACTION

Since this is a mobile based technology the primary thing you need is a: - Mobile Phone with an Internet Connection. A Non-Dormant Bank Account A Mobile Number which is linked to the Bank Account, through which you will be making payments. Debit Card of the same Account for setting M-Pin (4 or 6-digit passcode) for transaction verification. The next after having all these things is having the Interface or a mobile Application for initiating a transaction. Nowadays most of the banks have their own UPI Applications or portals for convenience of their customers. But the NPCI at first developed a separate application for this named BHIM (Bharat Interface for Money) UPI. Install/Download any UPI Application. Complete OTP verification Process for registering as a user. Enter the Bank registered Mobile number to Add bank account from you will be making transactions. Create a unique UPI ID (A Virtual ID, sometimes auto-generated) Set a M-Pin for allowing transaction. Create a unique UPI ID (A Virtual ID, sometimes auto-generated) Set a M-Pin for allowing transaction. A Unique UPI ID by default is of format: - <Registered mobile number>@<abbreviation of bank's name> Which can be later changed. Out of all the Registered Banks in India by RBI, till date (Feb-2022) total of 304 Banks are live on UPI, The Graph (Fig. 1.0) above shows the registered number of banks per year till the month of Feb-22. An additional of 9 banks registered themselves on UPI in the month of March 2022 summing up to 313 to the tally.

Making a Payment

Sending or Receiving money through UPI is the easiest and convenient method among all, you don't have to enter bank details such as debit card number, confidential CVV, no OTP verification every time you make a payment. Also no fear of forgetting wallet at home, calculating change and managing them. The Process is very quick too because of User-Friendly Interfaces. Now the UI may change a bit from bank to bank and other Transaction apps which are popular in market e.g. Phonepe, Paytm and Google pay . The Steps are common among all: -

- Open the app on your phone along with stable internet connection.
- It will ask for an access password for accessing the UI.
- To make a payment you can enter either the phone number (registered) or UPI ID of the user you want to send money to.
- The Best way is to just scan the QR code if you are in a shop or wherever it is available.
- The basic details of user to send money will appear, after confirming enter the amount you want to Send and Proceed.
- The app will ask for a verification code to re confirm the transaction, there you enter your M-Pin you have set earlier and proceed for the Final time.
- Within a fraction of seconds, your transaction will complete given that Internet connection is good and there is no technical glitch or error in the app or from the bank or in the account.

Here, you made your Payment using UPI Technology Quick, Convenient and Hassle-free. Although the upper limit of transaction is not set and differs from bank-to-bank but no firm or service currently allows us to make a payment over 1,00,000 a day. Also not only Money Transaction but you can avail other facilities in the same way more efficiently like we can check our Account Balance and Transaction History, Check IFSC code of a particular bank, Set or Change M-Pin and add delete many Bank accounts or create as much UPI ID's you want.

USAGE AND EXPANSION OF UPI IN INDIA AND IN OTHER COUNTRIES

It all started with 21 PSU banks in the year 2016, due to their Customer base. From 93,000 transactions up to August 2016 to 3 billion transactions in the Financial year 2018. The Third party PSP entities were the main driving force behind this tech. On 1 January, 2019, UPI became a popular method to buy IPO's. With exponential growth of UPI, India became the world's largest real-time payment market with 2,550 crores (25.5 billion) annual transactions in 2020 as per data from ACI Worldwide and Global Data leaving behind China and United States. Initiated by Paytm and now continued by phonepe and others, the awareness they created was unmatchable and probably we could have seen such a use of UPI Transaction across the world today. Below is the table which shows which companies and banks started accepting UPI as a payment option.

CONCLUSION

As per the above study, it concludes that UPI was the need of hour. A Fast, Convenient, Efficient, Smooth and hassle-free real-time payment platform developed indigenously in India with the aim to Digitalize the Nation. We saw how we set up a different controlling body and it proved to be beneficial at the End, The Strategies and driving forces behind its Expansion. But it's never the end but a new beginning as there is lot to improve and we hope that this awareness spreads throughout the world and the world must know about this technology so as it would be a boon for the Humanity.

UPI – THE NEED, INVENTION AND USE OF UNIFIED PAYMENT INTERFACE FOR QUICK AND CONVENIENT TRANSACTIONS.

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