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COLLEGE OF ENGINEERING & MANAGEMENT

MANGALURU

(An Autonomous Institution)

-ARCHIVES

2k21

Technical Magazine

Department of Information Science and Engineering

From The Desk

Message From the HOD

Dr. Mustafa Basthikodi
HoD, Dept of ISE

It is a matter of pride and privilege for me to head the Information Science and Engineering department.

As stated in the institute's tagline, the department's main goal is to "**Empower the Young Minds**".

Department magazine is an eloquent way of bringing hidden talents. It gives me immense pleasure to express my thoughts on the publication of the departmental magazine. Our budding talents have used creativity to convey their thoughts, ideas, dreams, feelings, aspirations, and convictions.
This magazine aims at providing a platform to students to explore their talent capabilities, express their creativity and writing skill.

My thanks to our esteemed members of the editorial board for their co-operation and support and bringing the best hidden talents in the magazine.

DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING

VISION

To be a center of excellence in Information Science and Engineering through the interactive teaching learning process, research, and innovation.

MISSION

M1. Creating competitive ambience to enhance the innovative and experiential learning process through state of the art infrastructure.

M2. Grooming young minds through industry-institute interactions to solve societal issues and inculcate affinity towards research and entrepreneurship.

M3. Promoting teamwork and leadership qualities through inter-disciplinary activities in diversified areas of information science and engineering.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1: Possess theoretical and practical knowledge to identify, scrutinize, formulate and solve challenging problems related to dynamically evolving information science.

PEO2: Inculcate core competency, professionalism and ethics to cater industrial needs and to solve societal problems.

PEO3: Engage in Lifelong learning and stay intact to the transformation in technologies and pursue research.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Exhibit competency and skills in distributed computing, information security, cyber security, data analytics, and machine learning.

PSO2: Able to provide sustainable solution to implement and validate information science projects.

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DATA PRIVACY SECURITY

The significance of 2 Factor-Authentication in securing data

- Niranjan Bhat
4SF19IS060

Data breaches have been a very common but a critical problem in the present-day IT industry. Attackers find various ways to breach a company's or personal data which may cause major catastrophe for the company or the targeted person. One of the ways in which attackers try to gain access to the data is by authentication-bypass. Authentication-bypass is an attack method in which the attacker pretends to be someone else and gets authenticated and gains access to the data which he may misuse. Authentication-bypass is done by phishing or social engineering to get the login credentials of an authenticated user. Using the credentials, the attacker logs into the user's account.

One of the best ways to stop this attack is having 2 Factor-Authentication(2FA) technology to login. In normal authentication, the user only provides only one authentication factor usually a password or a passcode. The 2FA uses this factor and adds another factor or a layer of security which is usually a security token or a biometric factor, such as fingerprint or facial scan. 2FA adds an additional layer of security to authentication which makes it harder for attackers to gain access to the person's accounts. Even if the attacker gets the user's password to an account, he must bypass another factor of security which is not possible in most cases. Due to the introduction of this technology, data breach from authentication bypass has notably reduced. Even though 2FA offers higher security as compared to traditional authentication, it is not 100 percent secure as it may still be vulnerable to some skilled social engineering and phishing techniques.

One of the best use cases of 2FA is in online social media and banking applications. In recent days, attackers have found various ways to get users social media passwords and gain access to their accounts. Too many accounts are being hacked because of this. Even though these applications have 2FA, most users are unaware of this which makes their accounts vulnerable to authentication-bypass. In conclusion, 2FA is a very powerful security measures that helps to keep online data secure and it is a technology more people need to be made aware of.

SOCIAL NETWORK MEDIA

SOCIAL MEDIA AND ATTENTION SPAN

- Thrishala N P
4SF19IS118

"A short attention span makes all your perceptions and relationships shallow and unsatisfying" - Eckhart Tolle.

Food, travel, entertainment, and all aspects of modern life are fast-paced in today's world. News is delivered to us in the form of headlines and status, and friends are just a text away. This is the result of the social media culture that is progressively affecting our society. Some claim it is a distraction but others call it multitasking.
Attention span is connected directly to the ability of a person to concentrate on a particular task before getting distracted. In the digital age, it seems the ability to stay focused is now considered a superpower. The propensity of the brain to change and adapt to the new emerging technology has caused a weak attention span. The occurrence of ADD (Attention Deficit Disorder) and ADHD (Attention Deficit Hyperactivity Disorder) has been rising rapidly over the past couple of decades.

Several physical and mental health issues can contribute to abbreviated attention spans, including poor diet, lack of exercise, and conditions such as depression and attention deficit hyperactivity disorder (ADHD). However, there are ways to improve our attention span amid ongoing texts, tweets, and notifications. A 2012 study found that mild dehydration can cause you to lose concentration. It is imperative to stay hydrated even when you don't feel thirsty. It is also seen that increasing your fitness level can do wonders for your attention span. Exercising the body is exercising the brain. The same study found an office worker gets only 11 minutes between each interruption, while it takes an average of 25 minutes to return to the original task after an interruption.

Top factors that impact attention:

1. Media Consumption:

Half the population reach for their phones when nothing is occupying their attention.

2. Social media usage:

Two-thirds of people get their information and news through social media.

3. Technology Adoption Rate:

59% of the people would feel lost if not given the devices they normally use.

4. Multi-Screening behaviour:

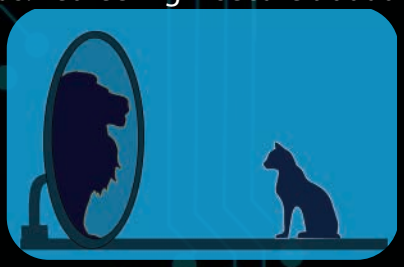
Two-thirds of people often use other devices while watching tv.

IGNITE YOUR INNER-STRENGTH

- Sahithya
4SF19IS086

"Self- confidence: The first requisite to great undertakings." -Samuel Johnson.

Self- confidence, like being rich – it is something we think everyone has but us. Yet feeling insecure about ourselves is perhaps the most common problems of humanity. The majority of people in society think, "You have to be born with it". This is not true. You can learn how to be confident, just like learning how to cook or drive a car. Self -confidence all boils down how to feel about ourselves. Our self-confidence begins to develop from the moment we were born. Many components affect the development of our self-esteem, for example – how we are raised, how people talk to us and things we experience during our lifetimes. Many of us tend to judge how well we are doing in life by what society think it is right or what the people who center our life think. We all have standards and expectations that we all tend to try to live up too. If we do not meet up to our standards, which most of us do not, our self-confidence begins to slowly decline. Many of us try to have unrealistic standards that we try to live up to and we tend to lose sight of the fact that we cannot be perfect.



"10 step plan" to increase confidence:

1. **Begin a journal**. Ask yourself what is making you feel like you cannot get to the point in life you want to reach.
2. **Remember the past is over**. You can only change the future. Write down 10 positive things about yourself.
3. **Accept yourself** and learn to love yourself to whom you are a person. Everyone has his or her own unique qualities and characteristics. We all are born differently for a reason. Do not compare yourself to others.
4. **Understand yourself** mentally, physically and spiritually.
5. **Be ready**. Self -confidence comes a lot easier to the person who is sure their ready.
6. **Strengthen your inner self**. Write down in your journal what you will be able to do once you acquire the confidence you need.
7. **Begin changing** what you do not like about yourself. Confidence comes from within.
8. **Notice the change** in our self-esteem and self-confidence. Reward yourself each time you do something that makes you feel proud. Go out some place or take it easy for the day.
9. **Learn how to give and take**. Confidence is being able to find a balance between giving help to people and excepting when we need help.
10. **Have the right amount of pride in yourself**. Remember, you are at your best when you are just YOU!

HOW 5G TECHNOLOGY WILL SHAPE THE FUTURE OF INDIA

- Vaibhav S Naik
4SF20IS109

One of the major game-changing fields is Industrial IoT for example anything happens in a giant factory with big machinery that coordinates with each other to optimize the manufacturing and supply chain of the company and this kind of task needs 1 to10Gbps of speed and this is expected to achieve by the 5G and Similar to this for accident detection system where if the accident happens in a lonely place which is relatively less populous then any of the devices which are not damaged like a smartwatch, smartphone, and infotainment system will automatically call the ambulance and if the smartwatch isn't damaged then it will calculate the blood pressure and all other possible medical situation and sent it to the hospital and also it will inform the police and towing company as well so by doing all these work an IoT can save a life without any human intervention so to achieve this feat 5G will play a big role.

There is a new game-changing concept comes into the picture which will be possible with the help of a 5G network is "CLOUD GAMING", similar to "CLOUD COMPUTING" before 4G or so we had to download a movie through torrent or buy a CD, etc. So for that to happen we need some free storage in our system but now with the help of "CLOUD COMPUTING" we just have to pay the service provider like Netflix or Amazon prime and we can watch movies online if have a storage of 10MB because the Netflix will have its servers stationed in Europe, Brazil and USA and the moment you press a movie icon in Netflix it connects to the server through its algorithm and starts playing the movie through their servers. This is very similar to how "CLOUD GAMING" works, Let's assume a high-end game like GTA-5, to play this game we need high-end PCs but in cloud gaming rather than owning a high-end pc which is necessary for running this game we can play the game in a pc with low specifications as well, that is when you open the game the complete processing of game is done in companies servers only and just because you are connected to 5G network you will not feel any kind of response delay so this task was nearly impossible without 5G.

CONCLUSION:

As we discussed in the above sections the 5G technology will bring revolution in the IoT field where devices can communicate with each other without any latency by which the work will be done more efficiently and because of less human labor the cost of production or transport will decrease and hence it will help in decreasing the cost per product and most importantly the gaming industry will see a boom like no other because a common man who owns a low-end PC can play a game which was impossible to play in his PC. And most importantly the connectivity is increased 10 times the value it was before. So basically 5G will help more economically to the people of India more with the gaming industry and with all the market opportunities it has which may be discovered further.

RAY TRACING (COMPUTER GRAPHICS)

- Kshiteesh Desai
4SF20IS045

Nowadays it's common to see tech gadgets with everyone. Every piece of technology which has a screen, uses video memory also called GPU(graphics processing unit). Some devices use dedicated GPU for performance acceleration, and some have basic requirements. In 3D computer graphics, ray tracing is a technique for modeling light transport for use in a wide variety of rendering algorithms for generating digital images. What is rendering? Rendering or image synthesis is the process of generating a photorealistic or non-photorealistic image from a 2D or 3D model by means of a computer program. The resulting image is referred to as the render. Multiple models can be defined in a scene file containing objects in a strictly defined language or data structure.

The scene file contains geometry, viewpoint, texture, lighting, and shading information describing the virtual scene. It's just like flip books. Flip books are classic way of representing any moving objects. The general science behind flip books, is each image is showed for a particular amount of time, and the next image related to prevent image is displayed. This generates the effect of moving object. Improvisation of this art led to generation of high detailed imagery. These high detailed imagery are cast out in the form of a game or video format, with the help of rendering and ray tracing technology.

On a spectrum of computational cost and visual fidelity, ray tracing-based rendering techniques, such as ray casting, recursive ray tracing, distribution ray tracing, photon mapping and path tracing, are generally slower and higher fidelity than scanline rendering methods. Thus, ray tracing was first deployed in applications where taking a relatively long time to render could be tolerated, such as in still computer-generated images, and film and television visual effects (VFX), but was less suited to real-time applications such as video games, where speed is critical in rendering each frame. Ray tracing is capable of simulating a variety of optical effects, such as reflection, refraction, soft shadows, scattering, depth of field, motion blur, caustics, ambient occlusion and dispersion phenomena such as chromatic aberration. It can also be used to trace the path of sound waves in a similar fashion to light waves, making it a viable option for more immersive sound design in video games by rendering realistic reverberation and echoes. In fact, any physical wave or particle phenomenon with approximately linear motion can be simulated with ray tracing. Most of the object simulator and physics simulator use ray tracing as part of the software. Optical ray tracing explains a method for producing visual images constructed in 3D computer graphics environments, with more photorealism than either ray casting or scanline rendering techniques.

It works by tracing a path from an imaginary eye through each pixel in a virtual screen, and calculating the color of the object visible through it. Scenes in ray tracing are described mathematically by a programmer or by a visual artist (normally using intermediary tools). Scenes may also incorporate data from images and models captured by means such as digital photography

New Future Of The World

- Mishaal Hussain
4SF20IS052

Technological developments have brought about profound changes in human lives .For many years now, technological advancements have drastically altered human existence. The mobile data revolution has been the most significant one in India over the past ten years. Data is the new oil, as Mr. Mukesh Ambani famously stated, and this is true. Data is the lifeblood of the digital economy, and the rate of expansion of the Indian mobile market is unmatched globally. The fourth industrial revolution has started, and it is being driven by connection, data, and artificial intelligence. Additionally, 5G is the new electricity that will advance it.

What is 5G, first of all?

The next-generation wireless access technology, known as 5G, can connect billions of devices and offers better data capacities and speeds of more than 10 GB per second. Mobile networks today must accommodate a wider range of requirements than ever before in the "Everything on Mobile" era. Globally, a variety of industries, including transportation, healthcare, and logistics, are projected to be redefined by 5G. In contrast to 3G and 4G, which mainly improved data transmission speeds for smartphones, 5G will enable communication between an infinite number of linked devices.

The major feature includes a throughput speed of up to 10 gigabytes per second, a huge reduction in latency to less than 1 millisecond (ms) from the current 50ms, and an exponential rise in the number of connections. Higher throughput translates to faster consumer network speeds. Consider schooling as an example. Virtual reality technology enables instruction and interaction with teachers in a virtual classroom for students living in areas with limited educational resources. It even allows them to perform tasks like conducting experiments in a virtual laboratory. To make this a reality, immersive video and virtual reality images must have a resolution that is close to what the human retina can detect in terms of detail. This calls for a throughput of 300 Mbps or more, which is more than 100 times the throughput needed to operate HD video services at the moment.

Digital growth is being driven by massive data adoption. There are currently just 322 million wireless broadband subscribers in India, but we predict that number will more than double to 1 billion by 2025. The market share of 4G technology is growing quickly as operators increasingly reduce their 2G and 3G footprints. In order to meet the rising need for data, we also expect commercial 5G to emerge by 2022, especially in urban regions. India's cost of 5G devices and other network equipment will decrease because to China's commercial 5G launch plan in 2019 and subsequent acceleration in 5G investment, which is anticipated to peak out in 2023.

In comparison to other countries, data charges in India are much higher. But in just four or five months, the robust competition sparked by RJIO's arrival has reduced data rates to less than one-third. This is intended to increase data consumption even further.

WHAT IS BLOCKCHAIN?

- Deeksha P K
4SF20IS029

Technological advancement has taken major strides in bringing liberation to the divergent human wants and gratifications. It is evident that technology is the backbone of the industrial revolution process that has occurred over the years and leads to a total overhaul from crude systems to modern efficient machinery.

Blockchain is a shared, immutable ledger that facilitates the process of recording transactions and tracking assets in a business network. An asset can be tangible (a house, car, cash, land) or intangible (intellectual property, patents, copyrights, branding). Virtually anything of value can be tracked and traded on a blockchain network, reducing risk and cutting costs for all involved.

Importance of blockchain: Business runs on information. The faster it's received and the more accurate it is, the better. Blockchain is ideal for delivering that information because it provides immediate, shared and completely transparent information stored on an immutable ledger that can be accessed only by permissioned network members. A blockchain network can track orders, payments, accounts, production and much more. And because members share a single view of the truth, you can see all details of a transaction end to end, giving you greater confidence, as well as new efficiencies and opportunities .The goal of blockchain is to allow digital information to be recorded and distributed, but not edited. In this way, a blockchain is the foundation for immutable ledgers, or records of transactions that cannot be altered, deleted, or destroyed.This is why blockchains are also known as a distributed ledger technology (DLT).

It was first proposed as a research project in 1991, the blockchain concept predated its first widespread application in use: Bitcoin, in 2009. In the years since, the use of blockchains has exploded via the creation of various crypto-currancies, decentralised finance (DeFi) applications, non-fungible tokens (NFTs), and smart contacts. What a blockchain does is to allow the data held in that database to be spread out among several network nodes at various locations. This not only creates redundancy but also maintains the fidelity of the data stored therein—if somebody tries to alter a record at one instance of the database, the other nodes would not be altered and thus would prevent a bad actor from doing so. If one user tampers with Bitcoin's record of transactions, all other nodes would cross-reference each other and easily pinpoint the node with the incorrect information. This system helps to establish an exact and transparent order of events. This way, no single node within the network can alter information held within it. Because of this, the information and history (such as of transactions of a cryptocurrency) are irreversible. Such a record could be a list of transactions (such as with a cryptocurrency), but it also is possible for a blockchain to hold a variety of other information like legal contracts, state identifications, or a company's product inventory.

Today, technology has made human life as easy as possible and strengthening the economy of the country and the world. On the other hand, this increasing use of technology has also negatively affected human health, so we all should use it only when needed.

HOW ARTIFICIAL INTELLIGENCE WILL CHANGE THE WORLD?

- B Anvitha Pai
4SF20IS021

AI is important because it forms the very foundation of computer learning. Through AI, computers have the ability to control massive amounts of data and use their learned intelligence to make optimal decisions and discoveries in fractions of the time that it would take humans.

Evolution of AI:

Artificial Intelligence is the intelligence possessed by the machines under which they can perform various functions with human help. With the help of AI, machines will be able to learn, solve problems, plan things, think, etc. AI for example, is the simulation of human intelligence by machines. In the field of technology, AI is evolving rapidly and it is believed that in the near future, AI is going to change human life very drastically and will most probably end all the crises of the world by sorting out the major problems.

History of AI:

Artificial Intelligence may seem to be a new technology but if we do a bit of research, we will find that it has roots deep in the past. In Greek Mythology, it is said that the concepts of AI were used. The model of Artificial neurons was first brought forward in 1943 by Warren McCulloch and Walter Pits. After seven years, in 1950, a research paper related to AI was published by Alan Turing which was titled Computer Machinery and Intelligence. The term AI was first coined in 1956 by John McCarthy, who is known as the father of AI.

Will AI Take Over the World?

AI is estimated to have a lasting impact on every industry as 60 percent of businesses are predicted to be affected by it. We're already seeing artificial intelligence in our smart devices, cars, healthcare system and favorite apps, and we'll continue to see its influence spread deeper into many other industries for the upcoming future. Over a decade ago, in the gaming arena, a super computer developed by American technology company IBM defeated the world chess champion, Gary Kasparov. Further, face recognition, self-driving cars, tumor detectors, etc. can be named as some remarkable achievements with applications of AI technology in the early twenty-first century. In medicine, AI has become more advanced than before and play a crucial role in the field. With the help of robots, doctors can now perform many types of complex surgical operations. It is now safe to say that these achievements are just the beginning. By the year 2025, machines that are better than us will have been fully developed. Medical robots can perform surgical operations independently. These are just a few examples of the AI miracles that are expected in the next few decades.

AI has exceeded all expectations with its unstoppable rise in the modern world. But as always, every coin has two sides. Decline in human creativity and innovative thoughts, unemployment, dangerous misuse are amongst the disadvantages of Artificial Intelligence. We may just have seen the beginning of the AI technology but the future is still ours to decide.

ಮಳೆ

- Nima
4SF19IS059

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Technical Events & Activities

HACKNIGHT:21

This was one of the first events post pandemic. This event was conducted in blended mode and had participants from the college as well as various parts of the country. This event had nearly 40 teams from various colleges.

hod.is.engg@sahyadri.edu.in
+91-9844535720