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Estd. in 2001

THE BYTE

2021-22

Edition 7-volume-1

FE INCHARGE

DR SUNITA PACHORI

Department of engineering sciences and humanities plays an extremely crucial role in an engineering college. It firmly believes in the overall holistic development of an individual and does not restrict itself to one domain or branch. Instead, the department profoundly focuses on creating an environment that caters to and facilitates for all the students of all the branches. It has been successful in organizing various events and activities for all the students which help them in exploring the domains of interest.

The department firmly believes in knowledge that can be gained by theoretical learning, skill can be obtained by practical and to get outcome students require attributes.

Department provides various platforms for budding engineering at the first-year level to enhance their writing skills, imagination, innovation in the form of various articles published in the department magazine Hence, we have our oldest and one of the most elegant magazines of the department called The Byte.

I wish that all my students contribute to our country's wealth and create a change in their life by bringing excellence!

The goal of publishing the byte magazine is to provide students with a platform to explore various technological domains and apply them to real-life problems. The Byte magazine also focuses on the innovations in technology that would prove a boon for humanity in the future. The editorial committee and all the student contributors of the department have worked enthusiastically hard to publish this magazine.

The interest of every student is unleashed through the articles they have contributed to this magazine. The process of making the magazine encouraged the student to research various topics related to technology and enhance their knowledge. It's a pleasure for me to have such students who work extremely hard and achieve feats in the field of science and technology. I am extremely happy with the contribution made by the first-year students.

I congratulate all the students for contributing and bringing this magazine to its fruition. Wish you all best wishes!

DEPUTY FE INCHARGE

MR ROHITKUMAR SINGH

Our students have the passion to do something really innovative and unique. I am very delighted to have such students who have utilized their talents to build up aspiring writers and give them a chance to publish their articles through our magazine-The Byte!

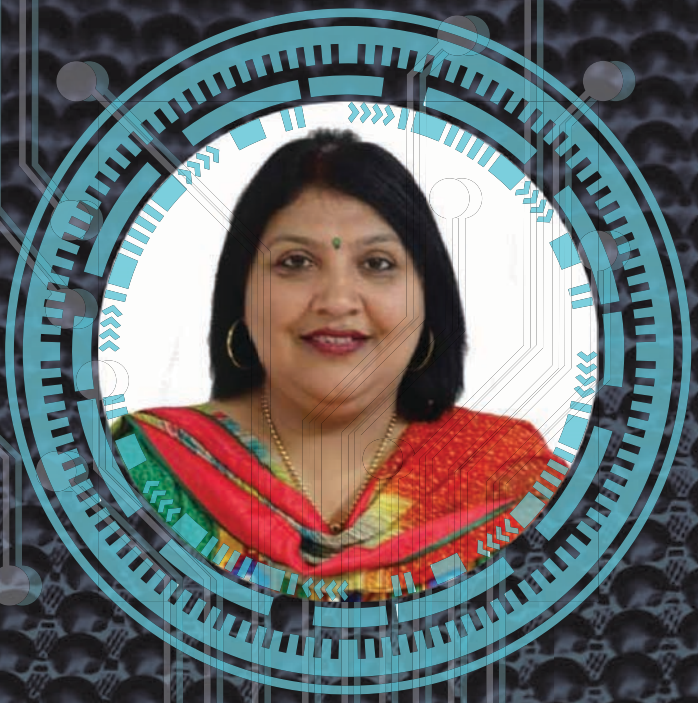
The Byte signifies the circle of knowledge and truly portrays the writer's intellect and gives them an amazing platform to showcase their writing skills. It is visible that the students have taken the initiative to promote the writing and publishing skills of students. The Byte Magazine has been a helper to our students to share and express their thoughts in a detailed manner.

The senior's column and the interview section is a must read and I can assure that this will surely be a great guidance tool for the students for planning their future. This is because of the motivational factor these sections have which would help our students to achieve the standard of excellence.

The magazine has a lot of importance because it not only provides a platform for the students to present multifaceted personalities but also makes them aware of their changing surroundings which could help them to adapt with. I am glad to take this opportunity to express my gratitude to our respected principal Dr. B.K. Mishra,vice principal Dr. Deven Shah and the faculty in-charges for their perpetual inspiration and never ending support. It is rightly said,"Teamwork is the ability to work together towards a common vision". With this, I would like to congratulate the students and the faculty members of the TCET-ISTE Byte Core Team for their amazing performance in publishing this edition of The Byte.

Wishing everyone all the best and hope that you all achieve success in your future endeavours.

ACTIVITY HEAD



DR RAJANI BAHGUNA

Each day is filled with new experiences through which we often learn valuable lessons and in turn, make our day better. Igniting sparks of creativity, ideas and supporting innovation is also the new way of proceeding with acquiring knowledge. TCET believes in an all-round development of aspirants for research and writing. Not only books, but articles are also a better way to induce imagination in our minds. I am delighted to present you The BYTE Magazine by Engineering Sciences and Humanities, 2021 Edition. It is not only important to showcase your creativity but also to make the readers curious and this can be done by expressing their ideas and on-going developments in Technology through Technical articles. The BYTE purely focuses on development of interdisciplinary and complex problems, to which the solutions must also be found in the same way. Its indeed due to the hard work of The BYTE Team and their true determination that this magazine is growing. Hard work is also the spirit of success and development. TCET provides an opportunity to the students to work hard and scale the extra mile. I congratulate all the members involved in the editorial committee of The Byte for executing such an incredible magazine. I assure you that the mix of curiosity and intellect will bring you a fine article which in turn, would make you wiser than the other engineering graduates.

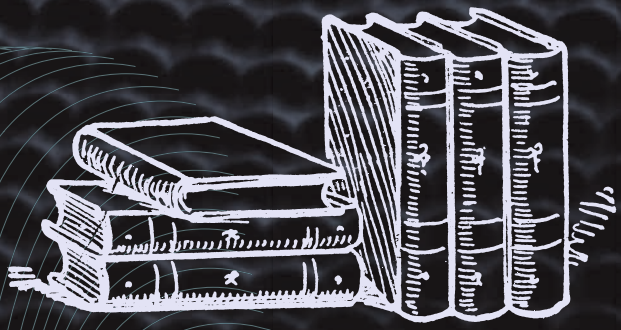
ES&H DEPARTMENT

With the vision “Education is the manifestation of perfection already existing in man”, Thakur College of Engineering has established its ES&H department which is responsible for the holistic development of students. ES&H stands for Engineering Sciences and Humanities which rightly defines the purpose, work, and mission of the department that is “To endeavor to provide a strong base in Engineering and Technology, where students, faculty, and staff work collaboratively to expand knowledge in the basic disciplines of providing a foundation that is appropriate to their career goals, equipping well with knowledge and skills that will allow them to function as responsible and contributing members of society.”

The department ensures that each student is provided with various opportunities to explore themselves as not only an academic being but as a candidate fit for decoding any kind of obstruction in their way.

“The Department of Humanities and Sciences shall strive to provide powerful educational effectiveness by linking facts, theory, inquiry, discovery, and solutions to real-world problems thereby providing a sound foundation to the undergraduate students.”

As our former president, late Dr. APJ Abdul Kalam rightly said "Educationists should build the capacities of the spirit of inquiry, creativity, entrepreneurial and moral leadership among students and become their role model." ES&H department of our college following the same organizes various events all year round with different genres such as technical, creative, performing arts, scientific, vocational, and many more. To develop the skill set of analysis, curiosity, demonstration, presentation and rest followed, the introduction of subjects like ABL, PS, have proven to be predominant in giving an in-depth experience of one’s all-round development. In order to provide an edge to their students, an International and National level conference MULTICON-W was organized. Besides this, the daily initiatives and activities show the ES&H department's efforts to give the students every possible opportunity to learn and show them that knowledge is not restricted and that the sky is not the limit.



Editor's Desk

This year has seen some of the most extraordinary events in human history. The severity and impact of the COVID-19 Pandemic have had a profound impact not only on our lives, lifestyles, and cognitive processes, but also on industry and academics. After the lockdown, it appears like everything has come to a halt. The silver lining, though, is how various industries have reacted and responded to these unusual circumstances using “Frontier sciences and cutting edge technologies” which is the theme of this edition of The Byte Magazine.

'The Byte is more than a publication.
For us, it is a visual depiction of all of our hard work, as well as a representation of the wonderful memories and experiences we enjoyed while working on it.
Our primary goal in publishing this journal is to bring to life our dear students' previously unseen enthusiasm, unwavering devotion, and unappreciated brilliance. 'The Byte' is a chance for students to come out of their shells and discuss their thoughts on technology without sacrificing any of their academic time.

We hope that our efforts are recognised and valued by all, and we pledge to continue providing content that each of you will enjoy reading.

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EVOLUTION OF MODERN TECHNOLOGY

BY SIDDHANT GAWAD
SE MECH-A

Abstract -

We are all aware of the numerous elements that influence the national economy, such as our ever-increasing population, which drives up demand for food, nutrition, health, clothing, and so on - to put it another way, our energy consumption needs are constantly increasing. We must foster the growth of research by providing it with the necessary environment as well as financial resources in order to meet this fast need for energy. Harnessing that advancement is the surest road to peace and prosperity. Frontier technologies provide the possibility of reviving production and making abundant resources available in order to permanently alleviate poverty, enabling more sustainable growth patterns, and reducing climate change. This may need stakeholders adapting the social contract to the new reality being created by frontier technology. Education will grow in importance as a tool for development and social fairness. Most importantly we must make a continuous effort to narrow the numerous disparities in technical skills that exist between developed and poor countries. To distribute the economic, social, and environmental benefits of frontier technology, more investment in infrastructure, as well as an integrated, and faster effort to improve innovation systems for sustainable development, is required. A number of cutting-edge technologies have the greatest potential to help accomplish the Sustainable Development Goals.

INTRODUCTION

Using new technology and innovations to achieve the Sustainable Development Goals and create wealthier, sustainable, healthy, and inclusive communities might therefore be revolutionary. By delivering real-time streams of information, big data analysis may aid in the management or resolution of significant global challenges, as well as the creation of new and improved decision-making. The Internet of Things provides for more effective monitoring and management of linked items and devices, as well as more effective monitoring of the natural environment, animals, and humans. Artificial Intelligence now includes image recognition, problem solving, and logical reasoning abilities that now exceed those of humans in some cases. Robotics has the potential to alter industrial processes and businesses, particularly in the manufacturing industry. 3D printing, which enables manufacturing of complex items and components at low cost and relatively smaller volumes, as well as recursive development of new goods required in a short period of time, fits into this category. Drones might revolutionize supply delivery, enable precision agriculture, and replace humans.

Risky occupations, while renewable technologies allow for power supply in remote and isolated rural regions hard to access to major power grids. Small-scale personalised monitoring of crops and environmental degradation will soon be accessible for more impoverished countries, enterprises, and institutions.

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CHALLENGES FACED BY FRONTIER TECHNOLOGIES

Developing policies and an enabling environment, as well as unparalleled resources – to support research and development related to the Sustainable Development Goals, transfer innovations and assist poor nations in developing their capacities – are all required through the use of technology in order to reach the Sustainable Development Goals. It also becomes inevitably vital to match skill supply, too quickly changing market demands. This necessitates flexibility in education policy and may need the transformation of education and training systems, since there is evidence that educational institutions are failing to keep up with technological advancements, resulting in skills shortages, particularly in digital technologies. (a) The huge discrepancy in R&d expenditure and inequitable distribution of researchers, mainly in developing nations; (b) The enormous distinctions in STEM education both between and within regions; (c) The impact of modern technology on manufacturing financial structural reforms; and (d) The need for educational establishment reform to allow better preparation of present and potential employees. (e) Digital disparities; and (f) the critical relationship between access to energy and Internet usage. This threatens to outrun societies' and politicians' ability to adjust to the changes they cause. This has caused widespread worry, leading to ambivalence about or rejection of technological developments like genome editing and deep learning. Policymakers will need to build strategies based on technical foresight and evaluation of potentially disruptive consequences of technology across years, if not decades, if communities are to deal better with the growing pace and complexity of technology advancement. This might also imply increased policy experimentation and the facilitation of shorter, more responsive innovation cycles.

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FEATURES OF FRONTIER TECHNOLOGIES

Through the increased usage of digital platforms, technologies are merging to create new Innovative technologies, which are anticipated to increase the rate of technological development, leading in simultaneous technology-induced transformative shifts across numerous industries. They are altering how people interact, work, manage their social lives, and keep track of their health. They are also reorganizing business and government. Platforms built on the Internet are providing new opportunities for entrepreneurs all over the globe to build new technology- based enterprises, as well as allowing both start-ups and established SMEs to reach international markets. While international trade has stalled and cross-border money has increased exponentially, there has been a significant increase in the flow of data and information, with significant implications for job creation in developing countries and the economies' connectedness to the global economy, as well as global information, education, and entertainment. These platforms have also resulted in a significant decrease in the cost of scientific research and company formation, resulting in a worldwide explosion of start-ups employing the Internet, cloud computing, artificial intelligence, 3D printing, drones, applications, and computational biology. Cloud computing and open source software have removed the need for big expenditures in servers and software, it is now possible to reduce the cost and labor requirements of starting an Internet business. A laptop/computer with an Internet connection, as well as cloud-based computing infrastructure for a software company or a 3D printer for a material product company, are the primary non-labor expenditures of a start- up. Advances in ICTs may also make it easier to produce and distribute water, which is a persistent concern for national, regional, and municipal governments. IoT devices such as sensors, meters, and mobile phones can help to enhance water management.

CONCLUSION

The global availability of cutting-edge technology at ever- lower prices can enable entrepreneurs to develop new enterprises and organizations, as well as governments, to use these technologies and draw on a large and growing network of platform users. Convergence boosts technological strength, but it may also result in a concentration of power in large market participants, which may have a detrimental influence on the empowerment of operators from underdeveloped countries some technologies may also be vulnerable to overexploitation; thus, governments and other stakeholders must be proactive in enacting rules to ensure that technology is dispersed equally within and among countries.

SPACE RACE 2.0

BY ADHISH KAUSHAL
SE IT-A

STRAIGHT OUT OF THIS WORLD!

The first Space Race was a rivalry in the twentieth century between two Cold War rivals, the Soviet Union (USSR) and the United States of America (USA), to attain superior spaceflight capacity. Its beginnings can be traced back to the two countries' post-World War II nuclear arms competition focused on ballistic missiles. The quantitative advantage displayed by spaceflight success was viewed as critical to national security, and it formed part of the iconography and ideology of the time. The Space Race resulted in the launch of revolutionary artificial satellites, robotic space probes to the Moon, Venus, and Mars, and manned spaceflight in low Earth orbit and eventually to the Moon in the 1960s. Subsequently, 50 years later, The space race has evolved into a competitive privatised industry of the twenty-first century, which includes sending thrusters to the earth's atmosphere (mesosphere and thermosphere), orbital flight rockets, and suborbital tourism-related spaceflights.

BILLIONAIRE SPACE RACE

Jeff Bezos, the man behind Blue Origin and the establishment of a viable manufacturing economy in space, is one of the billionaires engaged. Richard Branson is the founder of Virgin Galactic/Virgin Orbit, a company that specialises in space tourism, low-cost compact orbital launch systems, and international suborbital spaceflight. Elon Musk is the founder of SpaceX and a Mars colonisation project. Peter Diamandis, an American businessman, is credited with laying the framework for the billionaire space race and corporate spaceflight. In the 1980s, he formed the Students for the Exploration and Development of Space, an American national student space group (SEDS). Later on, Jeff Bezos became the chairman of a SEDS chapter. Diamandis, dissatisfied with the state of space development in the 1990s, decided to kickstart the suborbital space tourism business by establishing the X Prize. As a result, Paul Allen became involved in the competition, developing the Adaptive Composites Tier One SpaceShipOne and White Knight One platforms, which earned the Ansari X-Prize in the 2000s. The billionaire space race demonstrates that billionaires' goals go beyond simply executing government contracts, with their own gilding of the space age, in terms of increasing capabilities and enhancing their own shine. Elon Musk is looking forward to a new space race.

EVERYDAY APPLICATIONS OF SPACE TECHNOLOGY

There are a few technological advancements from the 1960s moon landing that are still in use today. Certainly, new technology in space travel will emerge; SpaceX has already built the Falcon 9, which is the "first spacecraft rocket capable of reentry." Thousands of start-ups have rushed to the space industry, introducing advanced technology such as artificial intelligence, quantum computing, phased array radar, space-based solar generation, and micro satellites and services with them. The military first created the global positioning system (GPS) for precise navigation and missile targeting. The GPS creators most likely had no idea how this innovation would revolutionise nearly every sector, as well as everyday life, on a worldwide scale. In the future, GPS will be used to aid new technologies such as self-driving automobiles and drone-delivered packages. The variety of technology developed during the space race is endless. Cordless headsets, Light bulbs, transportable wireless vacuums, lyophilized foods, memory foam, scratch-resistant eyeglass optics, and a slew of other commonplace items have all profited from space technology innovations. The Shuttle Portable Onboard Computer (SPOC), which was created in the early 1980s for the space shuttle programme, is a descendent of modern devices such as laptops.

THE GAME CHANGER

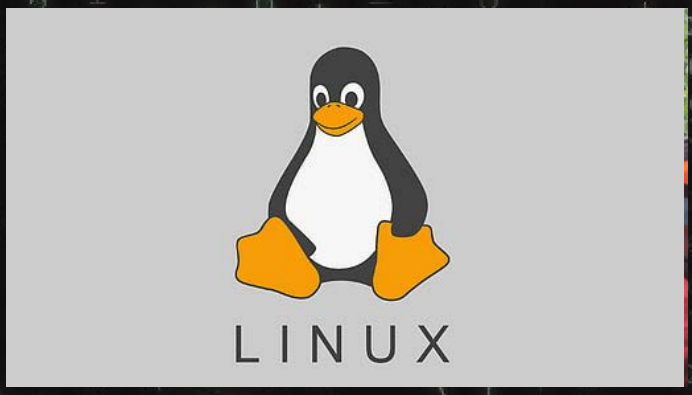
BY ADHISH KAUSHAL
SE IT-A

OPEN-SOURCE!

Unix is among the most widely used operating systems in the world due to its widespread support and availability. It was created in the mid-1970s as a multipurpose system for minicomputers and mainframe computers. Despite its occasionally complex interface and lack of central standardisation, it has now evolved to be one of the most popular operating systems worldwide. Linus Torvalds, a Finnish computer programmer, and the Free Software Foundation (FSF) developed the Linux operating system for the first time in the 1990s. Torvalds began developing Linux although still a student at the University of Helsinki, with the goal of creating a UNIX-like system. Version 0.02 of the Linux kernel, the operating system's core, was launched in 1991, while version 1.0 was released in 1994. At around the same time, Richard Stallman, an American software developer, and the Free Software Foundation (FSF) began working on GNU, an open-source UNIX-like operating system. Unlike Torvalds, Stallman and the FSF began by developing operating-system tools first. These utilities were then integrated into the Linux kernel to form the GNU/Linux operating system, or simply Linux.

LINUX - IN A NUTSHELL

Linux is first and foremost an operating system. An operating framework is a combination of software that manages hardware resources and provides a platform for programmers to execute in. Applications can use the operating system to store data, transmit documents to printers, and communicate with users, among other tasks. Consider an operating system to be a car engine. An engine can run on its own, but when it's coupled to a transmission, axles, and rotors, it creates a functional car. The remainder of the car will not work until the engine is working correctly. Linux is a kernel as well. When the term "Linux" is used, it usually refers to the entire Linux operating system. It can, however, refer to merely the Linux kernel. The Linux kernel is the computer system's core or brain. It's the layer that stands among both hardware and software. In other words, it serves as a bridge between hardware and software components. Other elements, in addition to the kernel, are required for a functional OS. Framework libraries, graphical user interfaces, email applications, internet browsers, and other programmes are examples of these aspects.



EVOLUTION OF LINUX

Due to the sheer contributions of enthusiast developers, Linux grew during the 1990s. Although Linux is not as user-friendly as Microsoft Windows and Apple's Mac OS, it is a fast and stable operating system that seldom malfunctions. Linux, when combined with Apache, an open-source Web client, accounts for the majority of web servers. Linux is used for systems as broad as cellular telephones and supercomputers because it is open-source and so adaptable for multiple needs. Android, Google's mobile OS, is based on a customized Linux kernel, and Chrome OS, Google's operating system for the Chrome browser, is also based on Linux. User-friendly desktop interfaces, libreoffice, Internet browsers, and even games contributed to Linux's growth and made it more acceptable for domestic and office computers. Since the 1990s, new distributions (packages of Linux software) have been developed. Fedora, Manjaro, Linux Mint, CentOS, and Ubuntu are some of the most well-known distributions.

Today, Linux is a full-fledged Unix clone, able to run everything from the X Window System to TCP/IP, Emacs, Web, mail, and news services. Almost every important piece of free software has been adapted to Linux, and commercial software is becoming more widely available. Many programmers begin by building programmes for Linux and eventually port them to other Unix platforms. More technology is supported than in previous kernel versions.

Who would have predicted that this "tiny" Unix clone would grow up to dominate the desktop and server computing worlds?
So it's safe to say Tux, the linux penguin mascot, is here to stay for a long time!

CLOUD COMPUTING – THE SOLUTION TO ALL YOUR STORAGE PROBLEMS!

BY KHUSHI GUPTA
SE COMPS -A

Cloud computing is one of the most popular topics we've been hearing about all day, but Have you ever wondered why this topic is hyped up so much in the industry? Let us see what cloud computing means exactly! So cloud computing is multipurpose and high-performance internet-based computing. It can model and transform a large range of application requirements into a set of workflow tasks. Cloud computing emerged after the appearance of virtualization in software and hardware infrastructures, and hence cloud providers increasingly adopted it to offer their services to customers. It allows users to represent their computational needs conveniently for data retrieval, reformatting, and analysis. Over the past decades, researchers from different scientific domains, such as astronomy, physics, earth science, and bioinformatics, have used cloud platforms to model scientific applications for many real-world problems. Software developers have been using cloud technologies in their software solutions owing to their benefits, including scalability, availability, and flexibility. These applications are modeled as workflows, which allow complex and large scientific data sets to be analyzed and simulated in a cloud computing environment. This is because cloud computing has reduced the upfront capital expenditure on hardware, software, hosting, and deployment.

It presents enormous opportunities that allow workflow applications to be scheduled at a reduced cost and time.

The cloud provides infinite resources that are accessible via the network on a pay-as-you-go basis. These infinite resources have made cloud computing a unique selling proposition in the IT sector. This has inspired tremendous research, leading to the deployment of highly technological platforms such as the internet of things and mobile edge computing. These platforms, through cloud computing, can create a smart environment that provides smart healthcare, cities, transportation, housing, energy, living, and many more, to facilitate our way of living.

We use different types of cloud technology and cloud providers offer different types of software as services to their users, such as Gmail, Google Docs, Google Sheets, and Google Forms. In this type of cloud, the user is not responsible for the development, deployment, and management of the services. The user here only uses them without worrying about their settings, configurations, etc.

Most organizations have already adopted cloud computing in their business, and do not take the security of data or networks seriously. One of the key aspects of the future of cloud computing is higher security. Due to the dependency of most companies on cloud computing, there is also an issue of safety that needs to be addressed on a priority basis. Cybercriminals are always looking for an opportunity to steal data or corrupt it. Cloud computing involves a large amount of data; hence, there needs to be more focus on reliability and security. All the stakeholders are equally responsible for the security of the data and network.

As we all know, in the emerging field of technology, the most discussed subjects have been artificial intelligence, machine learning, and the Internet of Things.

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Today, IoT has brought all the users under one network, enabling us to communicate with each other using any device connected to the network. Cloud computing can be leveraged by IoT devices as it offers high speed, performance, and flexibility. Moreover, it also offers ample storage space for keeping the data safe, finding resources, and sharing information between users.

Data loss, data security, and inconvenience in accessing the data are some of the major problems that users face, but with the use of cloud computing, these problems can be easily resolved. Some of the major future aspects are:

1. Migration time will become negligible.
2. Data is secured and data loss is minimized.
1. One user-many devices relationship
1. High level of service for computational resources
1. The geographical distance between clients and servers can be avoided;
1. High level of service for computational resources
1. Bandwidth will be adequate for users; and
1. Data redundancy is reduced.

The Microsoft suite of cloud-based services includes a new technical preview of data mining in the cloud ("DMCloud"). DMCloud allows you to perform some basic data mining tasks by leveraging a cloud-based Analysis Services connection. DMCloud is a valuable capability for IWs that would like to consider SQL Server Data Mining without the added burden of needing a technology professional to first install Analysis Services. Furthermore, IWs can use the DMCloud services regardless of where they are physically located as long as they have an Internet connection!

Cloud computing provides lots of benefits to users and makes their work much easier. The security of data and emerging technology have given new birth to cloud computing and have helped a lot in its comeback. One could argue that it will be the most useful and beneficial thing for anyone who uses it in the future. In the future, it will be the rising star of technology. And hence, we can conclude that cloud computing can turn out to be one of the best alternatives for us to store your data... And we can definitely say that this is an emerging field, so there is a lot to come, so let's just see how this invisible storage works out!!

5G – FUTURE OF WORLD

BY SUDHA PAUDEL
SE CIVIL-B

What is 5G ?

5G is the fifth generation of wireless information networks. Its options and quality are on the far side human expectations. 5G can have a control on the whole business, creating safe transportation, remote health care, precise farming, digital designing - and a lot of - a reality.

5G allows an innovative variety of network designed to build connections between the people and media like devices. 5G infrastructure will act as a flywheel to create a series of services designed to make people's lives with a little tiredness, which makes people feel like gods on Earth. 5G with Internet of Things (Internet of Things, IoT) will make things bend at the will of men. Items, such as cars, houses, windows, lights, mixers, washing machines, will be used. By considering the many resources and different aspects of fashion, researchers expect that this technology will be used until the 2040s.

DEPLOYMENT

South Korea, China, and the United States are the world's leading countries in the development and distribution of 5G technology. Even small countries like Sweden, Turkey, and Estonia have taken important steps to make 5G networks available to their citizens.

In April 2019, South Korea was announced as the first country to use 5G by the maximum consumers. South Korea is sooner than different countries in 5G use. The country has rolled out 5G in 85 cities since Jan. 2020. Government officials estimate that 90% of Korean mobile users will be on the 5G network by 2026.

After South Korea, China is ranked second as the country with the most 5G cities. As of Jan. By 2020, China had rolled out 5G technology in 57 cities.

Japan has met its goal of launching 5G mobile service by 2020. Japan's largest network company, NTT DOCOMO, began its 5G demand in 2010 with a first test. In September 2019, the company introduced pre-commercial 5G services.

Nine companies: Altiostar, Cisco Systems, Datang Telecom / Fiberhome, Ericsson, Huawei, Nokia, Qualcomm, Samsung and ZTE sell 5G wireless hardware and 5G systems to network operators.

ADVANTAGES

High download speeds: 5G networks can increase download speeds by 20 times (from 200Mbps (4G) to 10Gbps (5G)) and reduce latency (response time between devices).

Hyper-Connectivity: 5G networks promise stronger networking, down to the most popular “smart cities”. Optimal performance of these new features depends on 5G bandwidth and the Internet of Things (IoT).

Process optimization: Their implementation is expected to change in areas such as medical (remote control, etc.), traffic management, private cars, and in the construction sector to increase resources and mitigate risk.

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.DISAVANTAGES

Immediate Expiration: To switch to a 5G network, you need a device that can support it. Current 4G devices do not have this feature and will soon expire.

Technology Exclusion: The implementation of 5G networks also means a lack of direct access to the central packets and a delay in use due to less resources.

inadequate Infrastructure: For 5G networks to function properly, it requires a large investment in infrastructure to increase bandwidth and coverage and is not cheap. This situation will lead to delays in its use due to the high costs that governments have to pay for 5G to function properly.

Data Security and Management Risks: All of this requires complete data management, where there is a conflict of benefits and risks. In fact, not only topics such as big data strategies are being studied in managing all this information, both for businesses and individuals, and even for governments.

When will 5G launch in India?

"4G is already the leading network technology in India and will continue to play an important role in the market for some years, even after the introduction of 5G. 5G trials have started in the country. In January 2021, Airtel has become the industry's first service to successfully deliver 5G services over Hyderabad's 4G live network. Jio has also launched its 5G experiments in Mumbai using its built-in technology.

FUTURE SCOPE

5G technology will provide a wide range of devices such as car, natural sensor, thermostats and other streaming devices. For example, 5G can also help private cars with roads, lights, signals and parking meters. Medical providers can also rely on 5G to quickly transmit high-resolution images to diagnose and treat disease.

The advent of 5G, a fifth-generation network technology, has been new more recently so that wireless production has encouraged dialectical development in many countries and regions to accelerate the use of such technology. The photon strength of mm Waves ranges from 0.1 to 1.2 mm. Millimeter Wave radiation is non-ionizing, and most importantly for safety is the warmth of the eyes and skin caused by the absorption of mm Wave energy in a person.

CONCLUSION

5G will be able to steadily satisfy the growing demand for 1000-second traffic. It will be able to connect 100 billion devices. It will also be able to deliver a seamless experience across a wide range of environments including high-volume traffic congestion, high-density connectivity, and high-speed mobility.

Comparisons between 5G and another generation of mobile phones have been shown and show that 5G networks are a promising network for high data demand and high capacity.

5G networks have become more intelligent, supporting all types of radio spectra and all types of devices, from simple car sensors to self-driving drivers. From embedded devices to private cars and drones, smart businesses, and devices of all types in the city, 5G networks connect things, people and the cloud. Billions of reliance on intelligent network devices, personalized data-rich services, and cloud apps create smarter, more powerful, and more active 5G network conditions. This move to 5G networks will eventually integrate computers and communications.

SOFT SKILLS

BY SUHANI PANDYA
SE E&TC-B

“Soft Skills get little respect but can make or break your career” – Peggy clause.
Soft skills are basically a reflection of your personality-based traits and behavioural characteristics.
Imagine, you have just completed your final year project, you are excited and nervous with tens of other blended emotions. You are finally satisfied and you are up to share it with the world. Unfortunately, no one is feeling this state as you are. What went wrong? The results still hold their valid position.
Communication.
Communication is not just talking, in fact so much more than that. It is a flow of energy, emotions and words, of course. It is in fact the art of talking that helps your state of mind travel through your words. It takes nothing but appropriate soft skills to validate your project.
According to a report, 89% of the recruiters have admitted that when a hire does not work out it is due to the lack of soft skills.
Many recruiters have specific rounds of interviews dedicated as a test for soft skills. These stats and facts are indeed a testament that you need to work on them as soon as possible.
One of the most important skill at workplace is teamwork and leadership. Teamwork ensures a healthy flow of ideas and builds leadership. Trust me a good listener is always the best teammate.

As much as it grooms your technical journey, soft skills are a gateway for leading a good image in the society as well.
You can simply replace some phrases you use in your daily life to sound more confident.
Example: 1) “I believe this can be…..” instead of “You know what? I am going to try this…..”
2) “What do you think about this?” instead of “Do you know what I mean?”
3) “Definitely this can be….” Instead of “I guess this can be…..”

Confidence is the key to the door of opportunities. These small changes in your daily life ensure a healthy confident image of you in the society. No one wants to work with someone who is not confident. A huge part of teamwork lies in how you behave and reciprocate in front of others.
Some things you can keep in mind to work efficiently with a team:
1) Share your thoughts and opinions frequently.
2) Give yourselves deadlines while working together.
3) Think logically and calmly if anything goes haywire.

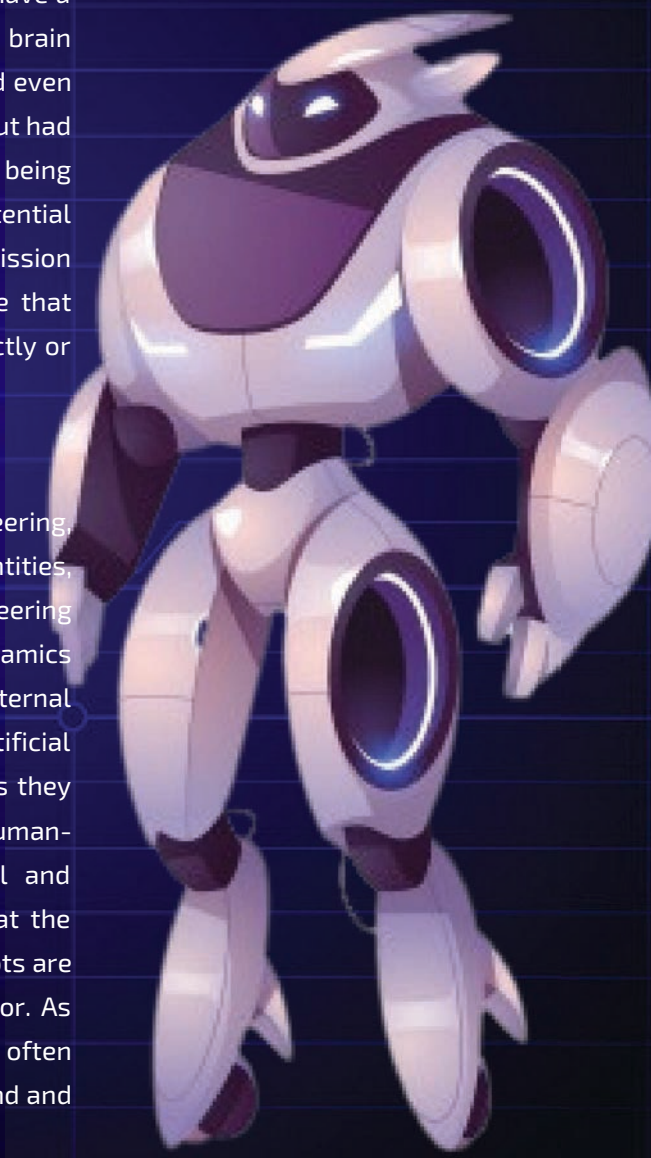
It is proven that soft skills increase your chances of getting hired. It is something that is going to stay with you forever. You may use your technical skills and knowledge in a certain project but soft skills would be the one that can help you change the whole perspective of the person interested in it.
It is about time when you need to understand the importance of these skills. There are many activities that can help you monitor such skills but the best method to monitor yourself is definitely jotting down the known and the unknown. Know what you are doing and what can be done.

ROBOTS FOR THE WIN

BY KANAK PANDIT
SE COMPS-B

A thought on robotics!!!

The human mind accompanied the body's evolution which resulted in a tremendously creative journey of the homo sapiens. The homo sapiens have a discerning thinking and can perform mathematical calculations in the brain that don't seem to go beyond the use of abacus unlike some which could even challenge a calculator and that's why we call them a human calculator. But had you not thought about something that is an exact replica of a human being whose thinking goes much beyond the human perception and has the potential to carry on exertion? Yes, today's intelligent brains are venturing on a mission to create an exact replica- the robots. Thanks to artificial intelligence that made it all possible to create a replica that could be our big helper directly or indirectly from miniscule to arduous tasks.



How can we describe robotics?

Robotics is a fusion of branches like computer science, mechanical engineering, electronics engineering and electrical engineering. Even in some quantities, physics and mathematics share their contribution too. Mechanical engineering involved in the study of robotics include motion of robotic arms, dynamics involve study of forces and the sensing involves collecting data from external surroundings and giving appropriate response. Motion planning and artificial intelligence usually form a constitute in computer engineering sector as they are mainly related to planning the way of action and development of human-centered brain. The hardware implementation is dealt by electrical and electronics engineering. Having taken birth with Artificial intelligence at the same time, robotics mainly deals with the manufacturing of robots. Robots are reprogrammable and can be described as a multi-functional manipulator. As said earlier robots exhibit humans, they do have an emotion. We often correlate emotion to heart, intelligence to brain and physical work to hand and legs. That's how robots are programmed too.

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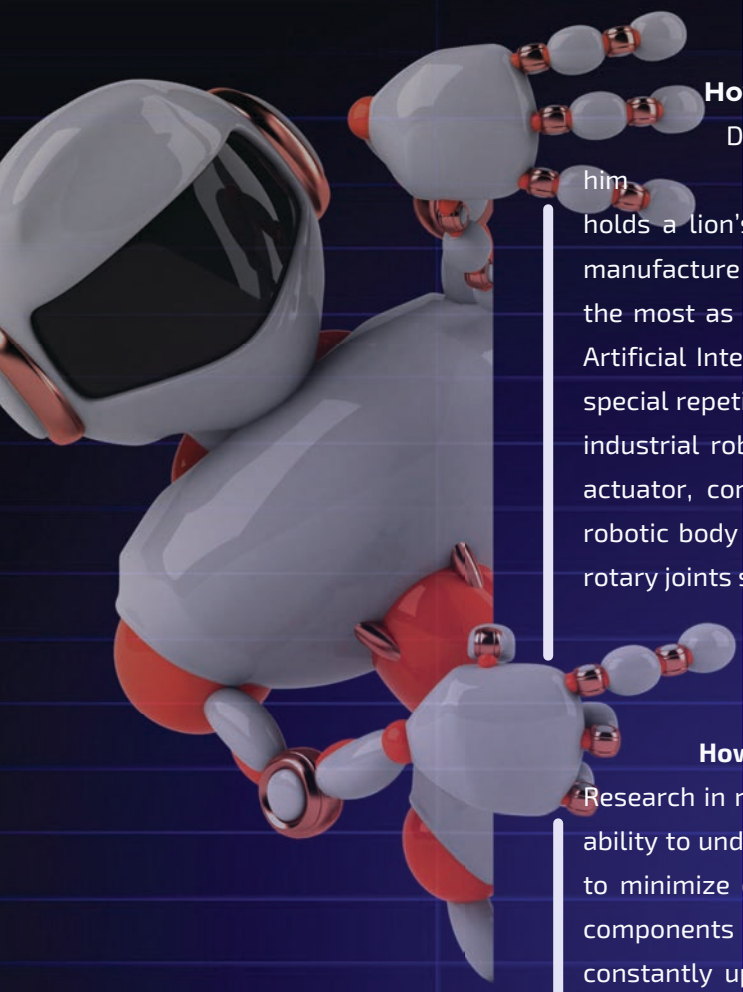

How do robots contribute in industries?

Don't worry- the gripper doesn't lift the worker up and drop him down on the other side. In industries, the field of robotics holds a lion's share in production. Batch production can be used to manufacture different kinds of products and that's where robots help the most as they are responsible for flexible automation. Specialized Artificial Intelligence includes mainly industrial robots which perform special repetitive tasks like industrial work. The basic components that industrial robots have are links, base and joints, end-effector, wrist, actuator, controller and sensors. A variety of joints are present in robotic body such as linear joints like prismatic and sliding joints and rotary joints such as a revolute and twisting joints.

How does research in robotics sound like?

Research in robotics is trendy these days. A researcher must have the ability to understand the problem and thereby come up with a solution to minimize errors. Also, proper knowledge of integration of foreign components on the hardware is required so that robots would be constantly updated. Adding to it, proper funding agencies should be chosen to get maximum assistance for the manufacturing of robots. Robotics is used everywhere right from Robotic Soccer to Space Robotics. Even elderly people are assisted by the autonomous robots and distributed computing technologies. A proper plan is necessary before making a robot depending on the type of robot.

Will robots rule the world in the future?

This somewhat feels like a science fiction movie where a war takes place between humans and robots. That will be a time when humans would have no control over robots and technology would rule you. Robot pessimists have always warned about this time and so many geniuses like Elon musk have come up to defeat their theories. Robots are inanimate objects so definitely they wouldn't have the right to vote or make decisions as they would never have their own will. Also, why would government build a robot which would go beyond its control?

Will we be replaced by robots in the future?

We always have a concern that in the future, we would be replaced by robots in the office and we would be unemployed but hardly anyone thinks that unemployed humans would not spend their money on government provisions and taxes which would drastically affect the global economy. Hence, the question of mass replacing of humans by robots should not come up in our mind.

RAPID VIRUS TESTING

BY ATHIRA ARVIND
SE ELEX

Rapid Antigen Test is a brand new form of diagnostic authorised through the Indian Council of Medical Research (ICMR) for instant detection of the virus that causes COVID-19 in patients. It is usually recommended to be used in subject settings in addition to in healthcare settings in aggregate with the gold popular RT-PCR Test.

These fast checks, which generally blend nasal or throat swabs with liquid on a paper strip to go back consequences inside 1/2 of an hour, are notion of as checks of infectiousness, now no longer of infection. They can discover best excessive viral loads, so they may pass over many humans with decrease tiers of the SARS-CoV-2 virus. But the wish is that they may assist to shrink the pandemic through speedy figuring out the maximum contagious humans, who would possibly in any other case unknowingly skip at the virus.

Rapid antigen checks provide some blessings over molecular assays. Testing may be deployed out of doors of health facility laboratories, and lots of may be completed through individuals of the overall public. They are pretty less expensive relative to RT-PCR and easy to interpret. They have a turnaround time as rapid as 15 minutes, bearing in mind checking out previous to front into congregate care centers or different public settings. They are well matched with samples taken from the anterior nares instead of the nasopharynx, making them extra snug for serial checking out.

The BinaxNOW check, made through Abbott Laboratories, is the maximum extensively to be had and normally used over the counter speedy antigen check. Other speedy exams legal through the U.S. Food and Drug Administration encompass the Ellume Covid-19 Home Test and the QuickVue check made through Quidel

What is a COVID-19 PCR test?

The polymerase chain reaction (PCR) test for COVID-19 is a molecular test that analyzes your top respiration specimen, searching out genetic material (ribonucleic acid or RNA) of SARS-CoV-2, the virus that causes COVID-19. Scientists use the PCR era to expand small quantities of RNA from specimens into deoxyribonucleic acid (DNA), that's replicated till SARS-CoV-2 is detectable if present. The PCR check has been the gold well-known check for diagnosing COVID-19 in view that it is legal to be used in February 2020. It's correct and reliable.

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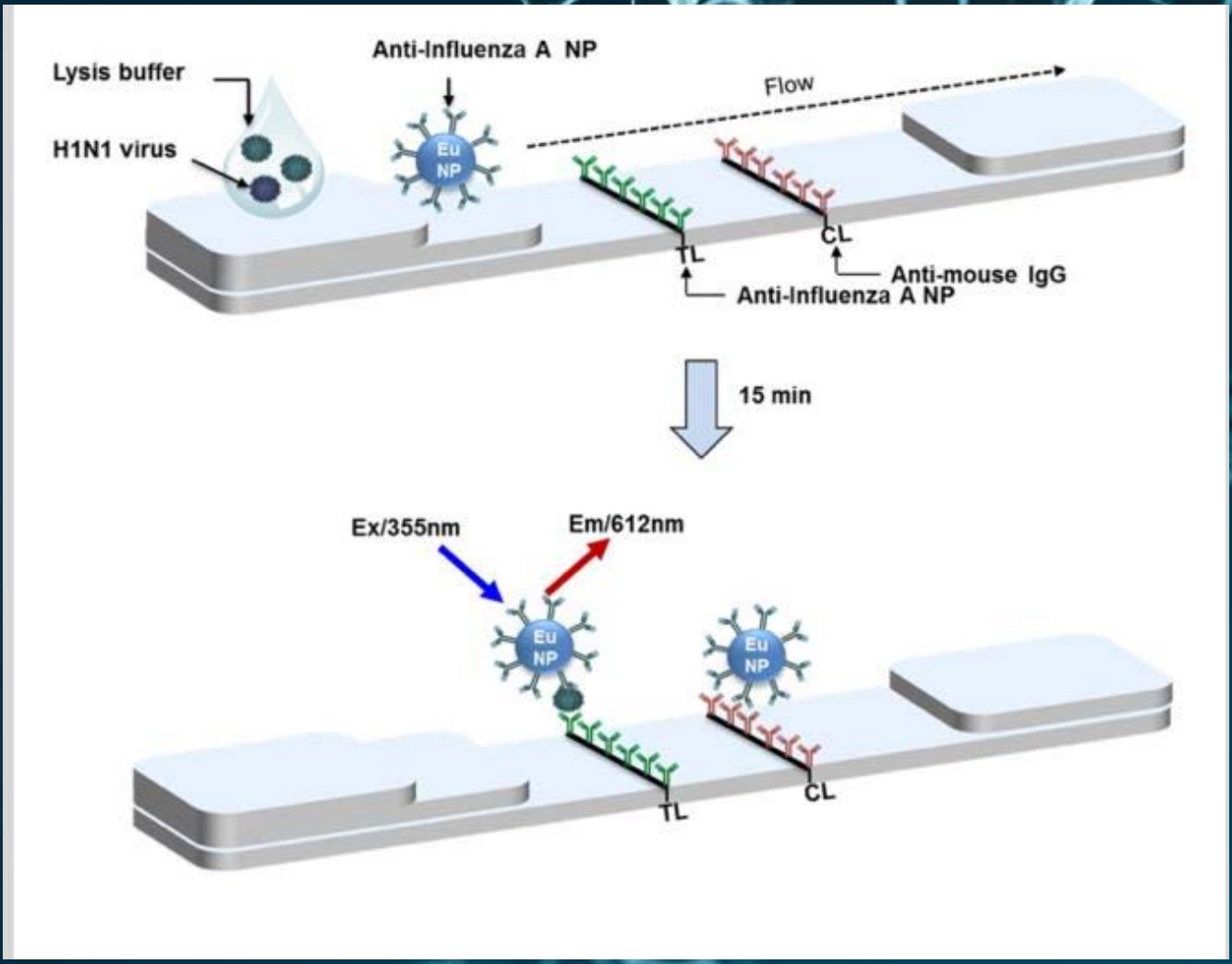


There are 3 key steps to the COVID-19 PCR test:

Sample collection: A healthcare issuer makes use of a swab to accumulate respiration fabric determined on your nostril. A swab is a gentle tip on a long, bendy stick that is going into your nostril. There are distinctive forms of nostril swabs, consisting of nasal swabs that accumulate a pattern at once inner your nostrils and nasopharyngeal swabs that cross in addition into the nasal hollow space for collection. Either sort of swab is enough for accumulating material for the COVID-19 PCR test. After collection, the swab is sealed in a tube after which it is dispatched to a laboratory.

Extraction: When a laboratory scientist gets the pattern, they isolate (extract) genetic fabric from the relaxation of the fabric withinside the pattern.

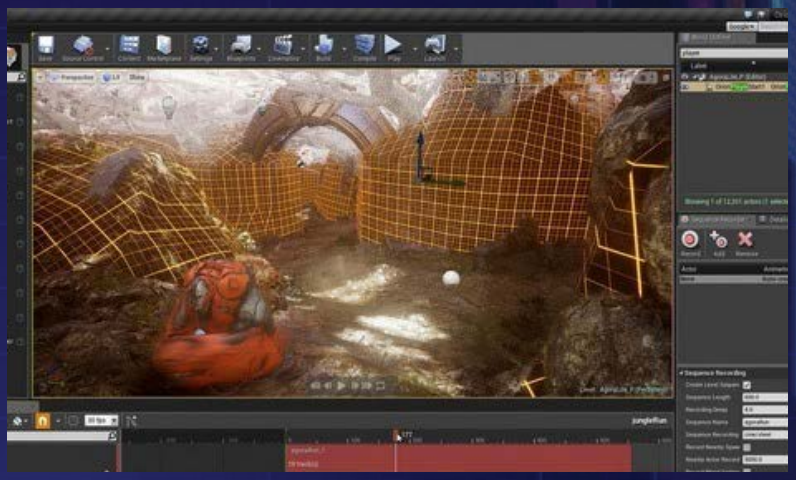
PCR: The PCR step then makes use of unique chemical compounds and enzymes and a PCR gadget known as a thermal cycler. Each heating and cooling cycle increases (amplifies) the quantity of the centered genetic fabric withinside the take a look at tube. After many cycles, hundreds of thousands of copies of a small part of the SARS-CoV-2 virus's genetic fabric are given inside the tube. One of the chemical compounds withinside the tube produces a fluorescent mild if SARS-CoV-2 is gift withinside the sample. Once amplified enough, the PCR gadget can stumble on this sign. Scientists use a unique software program to interpret the sign as an effective take a look at the result.

Rapid checks are at their maximum dependable while utilized in humans who've symptoms, scientists say. In these cases, speedy checks keep up properly towards the PCR checks processed in labs, that are generally used to diagnose Covid-19 through docs and normally take an afternoon or greater to process.

UNREAL ENGINE: THE DOORWAY TO INDIA'S DIGITAL FUTURE

BY ISHAAN MANE
SE COMPS -B

In 2020 the entire nation faced its first major setback since the dawn of the digital age back in 2016 in the form of COVID-19 Pandemic. Industries had to remain closed, lives halted and many people faced severe consequences during the imposed lockdown period. However, the only silver lining this dark cloud had, was the emergence and explosion of the IT industry in India. But this wasn't the only industry that boomed. The 2020 pandemic also saw the rise of many content creators world-wide and with a new and enormous consumer base which was present because of the pandemic, this industry was now finally a major one.



For absolute beginners, let's start by answering the question "What is a game engine". Is it the engine of the cars that we drive in open-world games? Absolutely not, a game engine is basically the blueprint creator of any modern computer game. Gone are the days where you had to write thousands of lines of code to realize a simple game character. The game engine is the modern way of designing and realizing each and every minute detail of the entire gaming environment. From character movement, vehicle movement to how does your character look while speaking, game cinematics, user interface, etc. each and every aspect can and is designed by a game engine.

Since now you know what a game engine is and have stopped imagining about cars whenever you read the word "engine", let me show you what Unreal Engine brings to the table.

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Let's start by knowing a few facts about Unreal Engine first. Launched by Epic Games (Yes, they created Fortnite) back in 1988 it was initially only designed to be another FPS (First Person Shooter) Game. However, it became more than that and is now used to create fighting games, RPGs, Stealth, and other MMORPGs. The entire engine is developed on and the uses the C++ programming language and the thing which makes this so powerful and popular is the ease with which beginners can learn this software and enter the ocean of game development.

Unity may be the preferred game development engine worldwide as it offers more versatility but Unreal Engine has been used for some of the classics and is still preferred over unity when it comes to designing games of the above-mentioned genres. Now you may ask who uses Unreal? here is a list of the top companies using this engine.

1.Nintendo

2.Valve Corporation

3.Rockstar Games

4.Electronic Arts

5.Sony Computer Entertainment

6.Activision Blizzard

Let's take a quick look at some of the features of this engine

1. Photoreal Rendering in Real-Time
2. Robust Multiplayer Framework
3. VFX & Particle Simulation
4. Film Quality Post-Process Effects
5. Advanced AI
6. Unreal Audio Engine
7. Limitless Extensibility

But the question "Why should I learn to use this engine?" still hasn't been answered, so let's answer this question now. Since Unreal Engine is user friendly it is not only used exclusively in game development but also in the film industry which requires heavy visual effect work. Unreal engine is capable of performing VFX and particle simulation with ease and hence is the preferred engine for the same in both the industries. Let's take a look at the advantages of this engine

1. The Graphic Quality of the Unreal Engine is amazing and workable.
2. The usability of the program is very much in demand.
3. The user interface of Unreal Engine keeps on updating with the latest and newer tools and options.
4. It has simple codes and uses nodes called Blueprints. These nodes help the users to create video games and other High-end games without writing scripts and codes.
5. This uses the C++ programming language, which itself makes the program a developer's first choice program.

So, to summarize Unreal Engine is basically that key which you need to level up your career if you belong in the entertainment industry. Now you may think that if Unreal Engine is giving such exceptional results, it may be really difficult to master this software. Hold your thoughts as you are absolutely incorrect. Becoming a master in anything surely takes a lot of practice and time but mastering Unreal engine is easy as compared to learning any other game engine. You only require to know the basics of Game Development and Game Designing. Basic knowledge about scripts and C++ programming language will surely be an add on for you.

With that I conclude that the gaming industry is about to revolutionize the entire entertainment industry and as we stand on the dawn of this revolutionary change learning Unreal engine with other game engines would surely be advantageous as we would posses the skills that the future demands.

COMBATING TECHNOLOGY AGAINST DRUGS

BY KANAK PANDIT
SE COMPS-B

We often imagine a world which is filled with knowledgeable people who never leave their life values just for the sake of materialistic pleasures. Although, superficially we find a world existing like that around us, yet the darker side of this world is still a big concern for mankind. The greed for money and the longing for negative hues in life has brought the world under the shackles of void and darkness. There's nobody who doesn't know about the drugs. Be it the busting of drug rackets or the smuggling happening at the airports, there's at always a news coming up about the same. Yet, don't we feel there should be a way to stop this?

"Nothing is impossible" has been a prime belief for the developers to give birth to a special instrument to prevent smuggling. Yes, it is none other than the immunosensor itself. It is a cheap and a versatile model that can help the policemen at the airport and can give dogs a sigh of relief of having a substitute to itself. Initially, a lot many combating techniques were devised to drive away the problem of smuggling yet it didn't gain fruits as expected. But this innovative technology, being cost-effective, has been successful in immunosensing opiates. For detecting illicit drugs, a wide variety of methods are employed ranging from thin layer chromatography to gas chromatography with the application of mass spectrometry. However, these methods have found to be costly and time consuming. Due to such issues, for quick detection of opiate drugs, a rapid screening test was developed which offered immunoanalytical techniques to detect the analytes quickly. In this technique, for the detection of analytes, certain antibodies need to be targeted. The hapten molecule forms covalent bond with carrier protein molecule resulting in the formation of antibodies.

The transducer in immunosensor is responsible for the detection of opioid. Different transducer based immunosensors are available like optical, piezoelectric, micromechanical, electrochemical, etc. The hapten is an incomplete antigen which binds to the carrier protein forming a complete antigen due to which electrical signals are generated that are processed by the transducer.

Due to the formation of immunocomplex, the optical properties of the transducer changes. The extent of change of these properties is measured by the optical immunosensors. After the detector detects it, the data is passed to the recorder which records it. The piezoelectric immunosensors work on the basis of change in mass of the quartz crystal. This change in mass is caused due to the formation of Antigen-Antibody complex on the surface of the transducer. This results in the change of oscillating frequency of the transducer which is detected by these immunosensors. An electric current is changed during the formation of complex which affects the amperometric properties of the transducer. Voltage and capacitance also changes. The oxidation and reduction of this analyte generates these electrochemical properties which is measured by electrochemical immunosensors.

Now-a-days, various researches to combat smuggling and reduce the usage of illicit drugs are coming out. Some non-invasive techniques were also developed to detect drugs in our body. South Korean researchers developed a sweat patch to detect illicit drugs. Such a novel technology can ward off the traditional technologies that included complex and time-consuming drug detection procedures.

**Buckminster Fuller rightly said," You never change things by fighting the existing reality.
To change something, build a new model that makes the existing model obsolete."**

STOCK MARKET PREDICTION USING MACHINE LEARNING

By Nandita Patra
SE IT-A

Machine learning is a branch of computer science that enables computers to learn without being explicitly programmed. Machine learning is one of the most fascinating technology that has ever been discovered. It gives the computer the ability to learn, making it more human-like, as the name implies. Machine learning is currently in use, possibly in far more locations than one might imagine.

Machine learning is a crucial a part of the rapidly expanding discipline of knowledge science. Algorithms are trained to get classifications or predictions using statistical approaches, revealing crucial insights in data processing initiatives. Then, with the purpose of influencing key growth indicators, these insights drive decision-making within applications and companies. The demand for data scientists will increase as big data increases and grows, demanding their aid in finding the most important business issues and, as a result, the data required to answer them.

A stock market is a public market where you may buy and sell shares in publicly listed companies. The stocks, also known as equities, show who owns the corporation. The stock exchange serves as a go-between for stock buyers and sellers. Stock exchanges help firms raise capital. It contributes to the accumulation of personal wealth. The stock market is used to assess the economy's health. It's a popular option for consumers to invest in firms that have a lot of room for growth.

Stock price prediction based on machine learning can help you anticipate the future value of a company's stock and other financial assets traded on an exchange. The whole point of stock price forecasting is to make a lot of money. It's difficult to predict how the stock market will fare. Other aspects, such as physical and psychological factors, reasonable and irrational conduct, and so on, have a role in the forecast. All of these elements combine to create a vibrant and turbulent stock market. This makes it extremely difficult to accurately estimate stock values.

Moving average, linear regression, k-nearest neighbours, decision trees, and other linear methods can be used to create an ML model for stock trading. Empirical evidence suggests that such algorithms for automated stock trading can be profitable. Given the problem's intricacy and multi-factorial dependencies, deep learning clearly matches the task better. Linear models are outperformed by deep learning models such as CNN, RNN, and, in particular, LSTM.

You'd want a machine learning algorithm to anticipate stock market prices for obvious reasons: automatic financial gains. Your goal is to obtain consistently accurate stock price forecasts as you develop a sophisticated machine learning model and train it on historical data from specific firms. Machine learning algorithms are clearly a powerful tool for this type of assignment. The stock market is known for its extreme volatility. There are numerous mutual dependencies with other aspects of human life. A human being's ability to consider all of these factors is nearly impossible.

A machine, on the other hand, does not need to sleep or relax. It can process and analyse large amounts of data far faster than a human could. A machine, on the other hand, cannot make conclusions based on analysis without human input. To achieve accuracy, machine learning algorithms must be correctly taught to recognise the patterns you're looking for. The issue is that there may be too much unpredictability, which disrupts patterns and throws any analysis off. Whether these algorithms are genuinely effective remains an open subject. Because the stock market is extremely volatile, developing a good machine learning system will take a lot of time and effort. This method can be successful if the process for training is done accurately, but it still remains to be seen whether machine learning will replace traditional methods in predicting the stock market.

DATA IS A NEW SCIENCE

By Aayushi Jha
SE COMPS-B

Motivation, struggle, hard work, awareness, knowledge and experience are one of the key factors of becoming a successful data scientist. Although data science is not a new line of employment, it has evolved significantly in last 50 years. The convoluted path of data science began in 1962 when mathematician John W. Tukey envisioned the outcome of modern-day electronic computing on data analysis as a pragmatic science. Yet, the concept of data science now is far away from the concept that Tukey imagined. The recognition of data science began in 2000 where various journals started to acknowledge the existence of Data science. Later, in 2005, the National science board favoured to establish data science as a career path which would be ensured by the experts who could successfully manage the digital data collection. In 2010, data science began to take centre stage against the backdrop of significant advancements in computing technology. In 2010, Apple launched its iPad in January and in the same year in July, Apple released its iPhone4. Customers began to embrace the technology- particularly the mobile technology.

The loose definition of data science is to analyses data of a business, to be able to produce applicable insights and recommendations for the business. The sophistication of Data Science majorly effects the standard and accuracy of data. The major trait of a good data scientist and analyst is to be curious enough to ask as many questions as possible. To master Data Science, you need the skills of business analyst, a statistician, a programmer and a machine learning developer. One should be able to find and collect the relevant data, analyse the data with selected tools and interpret the results. The profession of data science has emerged to solve computing and analytical problems of data that are not only big but also quite unstructured and messy. Data Science cannot be considered as a complete technical tool as it includes the statistics and mathematics including computer science, and information technology on a large extent. In recent survey of "The Hindu", it was revealed that there are 97,000 vacant data analytics in India due to lack of skilled professionals. E-commerce, Banking and finance, manufacturing, healthcare and transport are some of the major industries with high demands for data scientists.

The wheels of data science are driven by the curiosity for tackling data problems. Being consistent is the critical approach for improvement. To become a successful data scientist, it is not always necessary to rely on proven best methods but instead one should choose to experiments new variations and figure out what works. The pleasure of finding things can make a life more enjoyable.

"Data is a new Science; Big data holds the answers"- By Pet Gel Singer

NUCLEAR POWER PLANTS WITH AI IN INDUSTRY 4.0 ERA

BY ABHISHEK TIWARI
SE MECH-B

INTRODUCTION

To attain an advanced level of automation, development of artificial intelligence is required which ultimately enables the pathway for the fourth industrial revolution. Now we all know that in the future, energy demand is likely to increase rapidly. To fulfill the electricity need of the future, nuclear energy can make an appreciable contribution because of its low carbon emission.

CURRENT LIMITATIONS IN NPPs

1) VARIOUS FAULTS

During operation in NPP, faults like false alarming and missed Transmission of information are quite obvious to happen because of its complexity. The decision making process and data intelligence functions of conventional nuclear power plants are based on static algorithms. Although they have made an Impressive impact, they are often ineffective when dealing with such a Complex decision making environment.

2) LOW DEGREES OF AUTOMATION

The safety technology and protection capabilities of current nuclear power plants are still in their infancy. The automation level of NPP safety functions has not yet reached the sufficient level.

3) STRESSED HUMAN OPERATORS

To ensure that the system is stable and operating normally, the operator's task comes into picture. Operators used to monitor the system. In unusual situations, well trained operators should understand the fault in real-time. Some of the limitations of this operator is it cannot overcome the issue of mental work.

CURRENT AI-BASED APPLICATION IN NPPs

1) NUCLEAR FUEL MANAGEMENT

To ensure the quality of fuel composition and prevent possible accidents of nuclear fuel, it is necessary to systematize the management of nuclear fuel. At present, AI technology has been used to manage and process nuclear fuel effectively. In recent years, Team center, a well-known design management platform widely used in the manufacturing sector, has reached the nuclear power field. The system takes products as the core management object, including the combination, interrelation, and data analysis mechanism of data and information of the whole life cycle, such as product structure design, design analysis, test, manufacturing, and operation estimation. Unfortunately, research related to neural networks is rare currently but we affirm that there would be more and more people working on it.

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.2) FAULT DETECTION AND DIAGNOSIS

Fault detection and diagnosis (FDD) have always been an important research field that concerns the safety of an NPP. Currently, NPPs suffer from over intervention of human operators, bad accuracy, and efficiency in FDD. With the development of AI and other related technologies, more and more methods are applied in FDD. With the development of theory in machine learning, more and more advanced and intelligent technologies are applied in passive FDD. Anyway, there is nothing ambiguous about the fact that with deeper applications of AI in FDD, not only can the stress of human operators be greatly reduced, but also can the risk that a potential accident happens be relieved on a great scale.

3) EMERGENCY ALARMING

An interdisciplinary team from MIT has estimated that given the expected growth of nuclear power from 2005 to 2055, at least four serious nuclear accidents would be expected in that period. There are always uncertainties during the operation of NPPs such as human operation error or sudden failure of some devices which makes emergency alarming greatly important as emergency Alarming itself is directly related to the safety of an NPP. In the APS (Alarm Processing System), alarms are classified into two groups: generalized and special alarms. The generalized alarms are those that can be standardized according to the type of equipment, such as a pump, valve, or heater. The special alarms are those that cannot be included among the generalized alarms. In recent years, researchers applied the latest AI methodologies such as back-propagation and PCA in emergency warnings to improve the safety of NPPs. In the early stage, there have been many studies on multi-alarm systems in control rooms. In recent years, the multi-alarm system is still an important research field.

4) DECISION-MAKING ASSISTANCE

Decision making is strongly associated with FDD and alarm systems. While in this part, decision-making refers to a system or a framework that assists operators to make important decisions during operation or emergency rather than autonomous decision making by electric systems. Integrated decision support systems have already been developed at the early stage where Information, Diagnosis/Decision, Action cognitive models consisting of models for operator behaviors and control room operations are used so as to deal with problems during an accident and support the decision-making process of operators. But the early proposed system lacked efficiency and accuracy. For better safety, a Condition-Based Probabilistic Safety Assessment method is suggested by updating risk quantities through information collected from monitored systems or devices. The decision making would become more reliable and efficient with such risk estimation and a better maintenance strategy could be taken.

CONCLUSION

In summary, a nuclear power plant is too complex a system to be managed or operated by anyone's "gut feeling." An expert system can be the ever alert, knowledgeable assistant to the operators as well as a valuable tool for plant management. Demands for increased safety margins, lower environmental impacts, increased performance, and greater investment protection will inevitably lead to automation of most functions of nuclear power plants. In turn, automation will be paced by the ability to efficiently develop the needed software through the use of modern computer science brought about by AI programming techniques. The regulators and the public must be assured that these plants are properly designed, properly built, properly operated, and properly maintained. Artificial intelligence and expert systems can and must play a major role in providing this assurance.

ARTIFICAL INTELLIGENCE

By Shubhangi Joshi
SE ELEX

There are countless definitions of AI. I think Artificial Intelligence empowers machines and computers to perform problem-solving and decision-making abilities of the human mind. AI has the ability to replicate human intelligence in machines. Artificial intelligence was in the discussion after A.M Turning's work "Computing Machinery and Intelligence". In his work, he has urged the audience to ponder upon the question 'Can machines think?'. So, AI was actually discussed from the 1950s itself. The early work is the reason why we can witness automation and formal reasoning in our computers.

There are science fiction books written about AI. AI is depicted as a human-like robot that takes over the world. However, we all must realize that AI technologies are not that scary or smart, yet.

AI robotizes repetitive learning through data. AI can perform frequent, computerized, high-volume tasks effortlessly and without fatigue. Needless to say, humans are essential to set it up. AI adds intelligence and recommends corrections to boom the existing products. Smart machines, bots, and automation can be combined with the help of gigantic data availability. Products like Siri is the result of AI application. AI delivers remarkable accuracy. AI techniques have helped the medical field too. Deep learning and object recognition helps detect cancer on medical images with improved accuracy.

The fact that AI relies on big data is already impacting privacy in a major way. Along with this, AI comes with a high cost. There is complex machine involvement, the software programs need frequent up-gradation and the repair and maintenance cost. AI will perform the same function again and again if another command is not given.

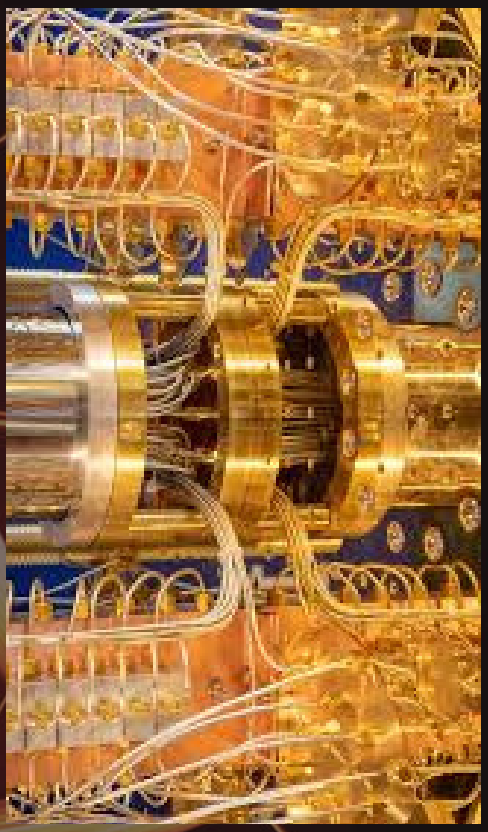
AI lacks the ability to improve with experience. Of course, it is a machine and hence with time, it leads to wear and tear. Machines can't be creative too. They perform the tasks that are commanded and unlike machines, humans are sensitive intellectuals with a blend of creativity.

AI will improve the way we expect, the way we explore, whether space or the ocean.

It is rightly said, necessity is the mother of all innovations, that is the case with AI. Human beings know that their needs are getting increasingly better in defining their wants and are quickly transforming this into reality. Dr. Kai-Fu Lee states "AI is going to change the world more than anything in the history of mankind. More than electricity." If implemented responsibly, AI can benefit society.

Superconductor Potentials are Revolutionary

BY HARDIK RAMPARIA & HRISHIKESH YADAV
SE IT-B



What is a Superconductor and how does it work?

The reason behind the word 'super' in a superconductor is the special feature about that conductor which seems to be magical and holds many applications. The condition to achieve superconductivity is to set the superconductor at a very low temperature, below -250K. The temperature from which the superconductor starts showing the superconductivity is the temperature threshold. The most important property exhibited by the superconductor at low temperature is that no net resistance is present in the material and the electrons can flow through the superconductors without any interruption in flow or loss of energy. Here the property is the advantage of the superconductor but the condition to achieve the superconductivity state is the main disadvantage of the superconductor. This condition restricts us from using it in many places. Whenever we have to use the superconductor in any application, there is always a need for coolant to make the superconductivity state constant. Because of this, many researchers are working on achieving superconductivity at room temperature. Recently, a superconductor was found that exhibits the superconductivity at T=15 degrees Celsius but it needs to be kept at extreme pressure. This is not feasible for application as it would be difficult to provide the constant extreme pressure. The alloy of many metals is used as a superconductor because it can show superconductivity at -250K< T>-200K.

The material of the superconductor is made up of many elements or different types of metallic alloys. When cooled below a certain threshold temperature, the material loses all the resistance and allows electric current to flow without energy loss and that's the biggest advantage of the superconductor. In normal conductors, the electron collapses with the atom as there is some vibration in the lattice. Cooling the superconductor decreases the vibration of the atoms in the lattice and because of that, the resistance of the superconductor decreases. Let us understand it in depth by looking at the same property at the quantum level. The interaction of the electrons with the vibrations of the atoms in the lattice produces a small net effective attraction between the electrons. The electrons form the bound pairs. The Bosonic electron pair (Cooper pair) is in the lowest energy level and all the electrons are in the same lowest energy level. The probability that a pair is broken is proportional to exp(–E(pair)/KT). It is not possible that any electron would be present alone because they form the bosonic electron pair and it behaves as a charge q but it is hard to tell what mass we have to take off that pair as we don't know the distance between the pair. This is the only reason there is no net resistance in the superconductor.

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USE OF SUPERCONDUCTOR IN QUANTUM COMPUTER:

What is Quantum Computer

Why Quantum with Computers? The actual meaning of the term quantum is a system that we can control and readout which behaves according to the generalized term “quantum model”. What is meant by hardware to be a quantum? It is like making a model. For example, if anyone wants to build a society then they are going to make a blueprint and according to that, they will make a small model to present the idea and perceive how it would look like.Quantum computing is a sort of calculation that outfits the aggregate properties of quantum states, like superposition, impedance, and entrapment, to perform estimations. The gadgets that perform quantum calculations are known as quantum PCs.

Quantum PCs are machines that utilize the properties of quantum physical science to store information and perform calculations. This can be amazingly profitable for specific errands where they could unfathomably outflank even our best supercomputers.

Traditional PCs, which incorporate cell phones and workstations, encode data in twofold "bits" that can either be 0s or 1s. In a quantum PC, the essential unit of memory is a quantum cycle or qubit.

Qubits are made utilizing actual frameworks, like the twist of an electron or the direction of a photon. These frameworks can be in a wide range of game plans at the same time, a property known as quantum superposition. The qubits are far more weird as compared to the covenential bits. The bits have two options 0 or 1 and the qubits also have the same options but before the measurements occur, we know utmost the chances of getting output as 0 or 1. We can’t know the actual outcome until we measure it. That’s why quantum superposition comes into the picture to represent that the qubit has not decided which outcome it will show even if the chance of outcome is fixed. Qubits can likewise be inseparably connected together utilizing a peculiarity called quantum snare. The outcome is that a progression of qubits can address various things all the while.

Why Superconductor is beneficial in Quantum Computer:

The three families of qubits are charge qubits, flux qubits, and hybrid qubits. To create a qubit, first the researchers have to find where they can access and control these quantum properties like quantum superposition, entanglement etc.

Heat is not good for quantum computers. Heat creates an error in the qubits that make a quantum computer tick. Quantum computers should be kept just above absolute temperature.

The fundamental constituents of matter are small and easily subjected to the noise. The challenge which quantum computing faces is making a physical device that’s robust to all errors. The redundancy makes the bits larger and no information leaks makes the bit smaller.

We use circuits with a huge number of electrons but google prevents Quantum errors with superconductivity. In regular metals like with the conventional DRAM circuit, every individual electron does its own thing. As electrons move around, they can bounce off the positively charged ions of the metal, radiating vibration waves that carry off quantum information about the electrons. This hectic, bustling instability of physical interaction generates a lot of quantum errors, and the information gets lost before we can use it. However, when certain metals are cooled down. The electrons join together in a single unit. The individual electrons are no longer scattered and the rate of quantum errors drops almost to 0. Our quantum bits are just electrical oscillators built from aluminium, which becomes superconductivity when cooled to below 1 degree Kelvin. The oscillator stores a small amount of electrical energy. When the oscillator is in the 0 state at that time it has zero energy. When it's in the 1 state, it has a single quantum of energy.

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FUTURE SCOPE OF WIRE MADE UP OF SUPERCONDUCTOR:

Use of superconducting wire in motor, automobile, aviation technology, etc. :

1) We can use the superconducting wire in a motor which will help to increase the efficiency of the motor, also it will help to reduce the heat generation problem and at the same time, it will prevent the current wastage.
2) In the aviation sector, we can use the electric motor instead of fuel and if the motor is made up of superconductor material then it would be more useful. But the biggest problem, for now, is that it is difficult to cool that motor while in aviation.
3) To use the wire made of superconductors in an electrical automobile.
4) It can be used in many home appliances and maybe, in future, it can replace the traditional copper wire.

CONCLUSION

For many years, superconductors have been a part of a discussion as we all know that it holds up a huge potential in its magical properties. In the future, it may change the whole world by its application. We are dealing with one biggest disadvantage of superconductors which is the temperature it needs to achieve the superconductivity. Researchers are making alloys of metal to get temperatures to at least -50 Kelvin so that it can be used in many areas of technology. If so, there will be no much use of the liquid helium then. It has the potential to be used in every sector of technology.

RUST – A NEW SOURCE OF FUEL

Dr. Neha Mishra
Assistant Professor
ES&H department
TCET

Iron powder is set to fill the energy gaps left by batteries and renewable energy
Unless you consider rocket scientists, who have been using metals as propellants for a long time. Iron, for example, is a potential material for storing renewable energy and powering long-distance transportation and heavy industries.

Jeff Bergthorson and colleagues from McGill University in Canada released a seminal study in 2015 laying out the notion of generating electricity by burning microscopic metal particles the size of flour or icing sugar. When metal powders are burnt, they react with the air to generate stable, non-toxic solid oxide products, which release a lot of heat but no carbon dioxide. The loop is closed by using hydrogen to convert the metal oxides back to pure metal.

According to Jeff, the metal fuel economy is identical to the hydrogen economy. 'In the hydrogen economy, clean electricity and water are separated into hydrogen and oxygen, which may then be transported and stored until being used in a fuel cell or burned.' Hydrogen, on the other hand, necessitates the use of massive, costly storage tanks. 'On a broad scale, that is not acceptable,' says Yuriy Shoshyn of the Eindhoven Technical University (TU/e) in the Netherlands.

Metals are inexpensive and have a high energy density, or the amount of energy produced per cubic metre of fuel. Iron is the most promising metal fuel since it is abundant and easy to store and transport. Iron oxide or rust is produced when iron powder is burned (Fe_2O_3). Using 'green' hydrogen, the rust may then be converted to pure iron.

'Basically, the concept is that you can utilise the same fuel, charging it up where you have clean energy and then using it where you need energy,' Jeff adds. For example, solar and wind farms in Canada might provide large amounts of renewable energy that could be used to synthesise and recycle iron fuel. 'We could export the fuel to England, where it could be used to generate clean electricity in the UK, and then the iron oxide could be returned to us to be recycled.' It's similar to a battery. 'It's just another way of storing and utilising energy,' he explains. 'Metals are excellent for storing energy for extended periods of time and transporting it across large distances. That's where the specialty is.'

\Wind turbines and solar panels are ideal for supplying electricity to national power systems. However, replacing fossil fuels in all modes of transportation, such as diesel, is a difficult undertaking. Although battery-powered vehicles play an important role, they are not suitable for heavy-duty transportation, such as large-scale cargo. Batteries are not suitable for long-term storage since they discharge with time.

Another major difficulty is figuring out how to sell renewable energy in place of oil and gas barrels and pipelines. 'Are we going to use these sorts of chemical fuels or are we going to have electrical cables transferring electricity throughout the world?' Jeff wonders. 'We suggest that if you want to transmit energy from Canada to Europe, for example, it makes far more sense to store it in solid and secure metals like iron or aluminium.'

'There has to be a green premium paid to make this transition work'

There are still technical challenges to overcome. One problem is that when iron burns it produces some nanoparticles, which are hard to collect and may be harmful if released into the atmosphere. Even a small amount of nanoparticles makes the burner technology inefficient because a fraction of iron is lost with each cycle.

Aluminium is another contender for metal fuel, although it burns at higher temperatures. Another possibility is to react metals such as aluminium with water to release heat and produce hydrogen gas, which can be burned or used in a fuel cell. Again, the metal forms an oxide, which can be recycled. Jeff's group is setting up a consortium to develop a prototype metal–water reactor.

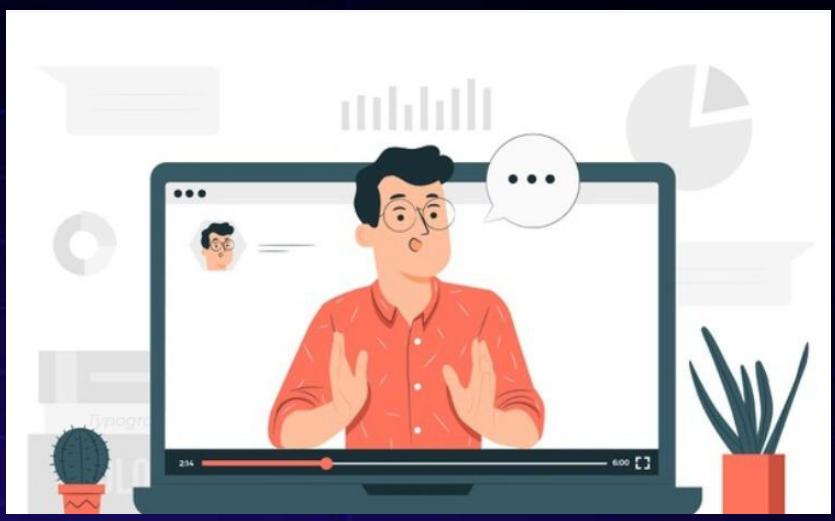
Even metals such as lithium and sodium have a role to play, with hydrogen-releasing reactions that occur when they are dropped into water. The metals are dangerous to handle and probably not suited to long-distance transport or storage, but could have industrial applications in closed loop cycles, says Jeff.

Ultimately, climate policies and falling costs of renewable energy will drive all of the metal technologies. 'There has to be a green premium paid to make this transition work,' he concludes.

SENIOR'S COLUMN

BY ARYA MISHRA
BE COMPS-A ,
GENERAL SECRATARY TSDW

Hello juniors,
It has been a strange year and a half. A period where you were all anxious, impatient and waiting to know what future holds for you and suddenly then a sprint to cover 3 semesters in less than a year. So much is learnt during this crisis but also so much of normalcy and life lessons are lost while studying from home with minimum human interaction. All I could do is share what I have learnt in past years in this college. All these lessons are extremely close to me and I live by them as they have taught me and helped me a lot in this journey. Here are the top things that I learnt.



Find your purpose

.Let us be honest, It is a lot to ask from an 18 year old to know what their five year plan is and what exactly they want in life. We have hardly experienced life to know what exactly we like and dislike. These four years are the best time to know what your true calling is. The only thing you need to do is be open to new experiences and be agile. In your initial years, you should say yes to everything but as the semesters pass by, start eliminating things that you don't enjoy or for sure don't see yourself doing in the long run. As you grow older, the list will narrow down and hopefully you will realize what you enjoy the most and is the most viable career option for you that brings joy to you.

Don't do it just for CV

Your primary reason to do anything should not stem from the fact that it might look good on your CV. Work for that NGO because you genuinely believe in the cause. Do that course on Udemy because you feel that it will add value to your skillset. Take part in that competition because it will be a new learning experience. The WHY behind what you do is the most precious thought, always know it and preserve it. It is ok to do just ONE thing with 100% dedication and making the most of it than doing THOUSAND things just so that it looks great on your CV. Quality over quantity ALWAYS.

Don't ignore the fundamentals

Al/ML/Data Science/IOT/Robotics, etc. are all extremely fascinating topics. They are definitely the future and if it is your calling then most definitely dedicate your time and efforts in learning them BUT in the process NEVER IGNORE the basics. No matter how many ML algorithms you know, if your basic maths, stats and subjects like data structure and databases are not clear, you cannot excel in the field. These are the basics and foundation and one must not neglect them at any cost. At the end of your job interviews, they just test your fundamentals. All the high tech fancy stuff will be taught to you in training and on field. So I would suggest, definitely study these emerging technologies, it is the future but in exchange do not ignore the past and the present.

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Collaborate and don't compete

We are social animals and it is in our DNA to grow together. You should never work in isolation because at the end of the day when you work in the corporate, you will work in a team. Everyone grows mutually when you share and learn together. Trust me, best work happens when you do it together. You will learn so much in process thay you can't if you did the same thing in isolation. So please discuss that problem that you did not get while participating in hackathon or study together when you prep for GRE/GATE,etc. This is not JEE, you all are not fighting for the same seat but co-existing together for having a better future. Push each other to be a better versions of yourselves.

As we once again step towards normalcy, I really hope that you all can experience college like my friends, classmates and I did. As the general secretary of this college, it is my duty to give the best college experience possible in my tenure and make up for the lost time. Let us all pray that things remain how they are now and from January we start with our most awaited offline events like T-Spark, Sojourn and some new exciting events.

Network and treasure your relations

Learning just doesn't only happen in class, it also happens in between the breaks while discussing sports/stocks or while prepping for the fests or while travelling back in the same rickshaw with your friend. Relations teach you life skills that you carry with yourself for lifetime. The friendships and connections you make here are not just limited to the four years, you may be surprised to know when which contact might come to your use. Maybe for that job referral or maybe for guidance during higher studies, the biggest gift that you take away from the college is the networking so proactively take efforts to build relations around you, they might change your life forever.

Do not feel the shame

I have seen a lot of students feeling guilty and ashamed of where they are in life right now. They are not happy about not landing their dream college for engineering. GOOD NEWS! At the end of the day, it is upto you where you want to be in life. An IIT would definitely give you a kickstart but it most definitely does not ensure a secure future. I have friends and seniors who are in the biggest tech giants who are not from IITs but our college and I know friends in IITs who are not happy with their choices. In such a populated country less than 1% make it to IITs, it doesn't make the remaining 99 worthless. You define your own worth. Accept and embrace where you are and rebuild that confidence. It will for sure make a great success story when you achieve your dreams and goals ;)

ALUMNI'S SECTION

PLACEMENT

MR SHAILENDRA BHARATI
MECHANICAL ENGINEER

Can you brief us about your profession?

I am working at a delivery company. It's a logistic, E-commerce and supply chain-based Indian company. I basically solve problems related to the shipments in which I try to connect shipments to the clients.

We viewed your profile and we found it to be very inspiring. As a part of such a company with a bunch of huge projects, what are the top 3 buzzwords according to you that you keep hearing in your company?

I don't get projects but targets to achieve. I got targets like in Diwali, there were a lot of shipments left behind. So, with my team, I managed to connect them with the clients. So, the three buzzwords I got to hear were "we", "planning", "Just Do It(J.D.I)".

How is your schedule and work-life balance?

In college, we are often engaged in activities which make us feel that we are the busiest on this planet. But, as and when you start your career, you get far more responsibilities and you realize the fact that student life is not as busy as it looks like. In my company, I have 6 days working and 1 day holiday. So, my work starts at 9:30 am and I get off work by 6 pm. So it's very important to plan your day and how you are going to prioritize your activities. I always make sure I spare some time for myself and learn more skills because I feel learning is very important.

Are you noticing any digital dexterity across your company and how is it impacting you?

In my company, to play with large volumes, I often try to carry on my tasks in a smarter way. Digital dexterity has proved instrumental for me because earlier, the company relied on pen and paper which made things harder. But now, things have gone so digital that the shipments are scanned and data is collected through electronic means to a centralized management system. This has been wonderful and saved time for many employees. To offload and unload the shipments in trucks, the conveyor belts substitute the manual labor work.

What is the post-covid scenario of the company?

If we compare the post-covid scenario with the previous quarter, the hiring is more. The companies that were shut down due to the pandemic have started again and are in need of manpower. The "work from home" culture is reducing and employees are being called in the office as many are getting vaccinated. So, now it's a good opportunity for the students to enhance their skills and secure a dream job easily.

How did our college help you in securing this dream job?

My college helped me in all possible ways. My college has made a remarkable contribution to secure me a job as they helped me in aptitude, technical, HR and GD. TCET organized student development programmes which really helped me a lot to find out the weaknesses in me and convert them to strengths. I followed an 8-hour hectic schedule in my college which helped me a lot in my company as I got habituated to sitting for an incredibly long time. The college provided me with aptitude tests in the last few semesters and lots of group discussion sessions. In such G.D. sessions, I sat with my group and started a brainstorming session which helped me in my interview.

What is your greatest professional achievement and how hard did you work for it?

As it has not been so long since I have joined the company, I don't really have any professional achievement as such but I have learned the progress of my colleagues who have worked in my company for a year or more and how they have been promoted based on their performance. Working for extra hours and taking extra effort can help us get promoted.

Can you elaborate on an experience where you faced downfall and how you worked on it?

I have failed in many interviews but still, I never lost hope and kept the determination to try my best to achieve success. It is rightly said, "failures are the stepping stones to success" and that became a source of motivation for me. I started working on my mistakes because of which I could secure a dream job in a reputed company. So experience has been the best teacher for me in my professional life.

Where do you see yourself in the next 5 years?

I am planning to run my own startup. I am actually trying to gain knowledge as to how the industry works. I am trying to work for some firms and get industry-level experience to see how things work. The ground reality is different. We feel that running a startup is easy and you ask your employees to work and they budge with you. But this doesn't work every time. You need to get true knowledge and that will help you gain trust over your employees which will create a great work culture in your company.

What message would you like to give to the future aspirants who want to secure such dream jobs?

Everyone is passionate about working in reputed companies like Wipro, Morgan Stanley, etc. but you need to know the requirements of the company. Like, some companies hold a separate test based on concepts like pseudocode and algorithms which needs separate and systematic preparation. So, it's important to know how the hiring process is and also connect to the people who have secured a job in such companies. My seniors supported me a lot and gave me a lot of guidance which helped me a lot in securing a job. The mock interviews and group discussions organized in the college should be taken seriously. Also, when you apply for a job in a company, you should continuously check your mails and not ignore them as the company prefers to mail you instead of calling. So you might end up losing the chance to work for the company if you don't check the mail and respond on time.

HIGHER STUDIES

MS NIHARIKA RANE
MECHANICAL ENGINEER

Can you brief us about which universities you are aiming for?

I would like to introduce myself. My name is Niharika. I have completed my graduation in mechanical engineering from Thakur College Of Engineering And Technology in 2021 and I am planning to pursue a master's in mechanical engineering from a Canadian university.

How are you preparing for grabbing such elite universities and when did you start preparing for it?

Firstly, I carried on extensive research on some of my favorite universities in the USA, Germany and Canada. I found that The USA and Germany always follow a change in policies every year and are never definite. I did not observe the same in the Canadian Universities, so I felt that Canada is the best choice for my education and future. There are some elite universities in Canada too like "McGill " and "Alberta " and they are in the top 100 Universities. After that decision, I started preparing right from my 3rd year but, there was an outbreak of the covid-19 pandemic which made me a bit worried that I will have to drop a year for that, but due to my conviction, I chose to give another chance to myself for building up my profile in this pandemic period and that has really benefited me.

Are you opting for any scholarship to study abroad and can you brief us about it?

Since I am applying for Canada, fees are less as compared to other countries and government-aided. The government of Canada conducts programs for students at a low cost as Canadian Universities do not provide you with a scholarship but there are some international scholarships provided if you have a stellar profile with brilliant academics. If you have good pointers, you have pretty good chances to secure a scholarship through the university website.

What perks can you get on studying abroad over studying in India?

India has witnessed tough competition over the years. The GATE exam which tests the comprehensive understanding of various U.G. subjects in engineering for admission into the Master's Program is pretty a tough nut to crack. In India, the syllabus prescribed by the university is not always a need of the industry which is not the case of foreign universities. The universities in the USA and Canada have provided freedom to their students to choose whatever they like and what their passion lies in. The foreign universities actually give us the liberty to choose our own domains to study and carry on their further research. I would also like to add that you learn a completely new culture and you get to meet and interact with new people which can indeed be a memorable experience.

Is it necessary to meet an overseas education consultant to reach our goal of studying abroad?

It is not a mandatory thing at all, However, I hired a consultant as it is definitely better if you have one. Consultants definitely help you with your doubts, SOP's and LOR's, But if you already have someone who knows the entire process thoroughly, then I don't recommend hiring a consultant.

What are the ups and downs you often have faced in the application process and how are you working on it?

Every university has a different method of applying to them, a single application cannot be used for 4 different universities. I recommend everyone to directly contact the university by emailing them with their doubts. Mostly you get a reply within 24 hours. Contacting them directly is the safest option and also saves a lot of time.

What made you feel that studying abroad is the right choice for you?

As mechanical engineering is a practical and on-site field, I felt that I won't get that much exposure in India that I will get abroad. Secondly, I feel that the Indian Universities support rote learning which is not the case of foreign universities. So, that is the reason why I chose masters.

How do your parents and our college help you in this wonderful venture?

My elder brother already studied abroad, so it didn't take me much time to convince my parents too about my decision. They supported me a lot throughout the application process. Similarly, my college too helped me a lot too in this process and the guidance I got from the faculty cannot be expressed in words. TCET faculties didn't only help me when I was in college but also supported me when I passed out of college. Be it the internships or student exchange programmes, I left no stone unturned just because of the backing of my teachers. The curricular and extracurricular activities I took in my college built my profie.

Can you brief us about the application process and the exams you need to give for getting into a foreign university?

This actually varies from country to country. Suppose you want to apply for Germany, then definitely you need to prove to them that you know the German language. This is applied to other countries as well. English is widely accepted, so you need to prepare for IELTS and TOEFL. Many students had a doubt about the GRE exam whose score was not accepted during the pandemic but now, they are looking forward to accepting the score.

What is the right time to actually apply for a foreign university?

According to me, the third year is the best time to apply to any foreign university as even if your application is rejected from a particular university you still have a year to build up your resume and apply once again in the 4th year. During this 1 year i suggest everyone to take up valuable internships or a job to gain those experience points. However I've seen people who have worked a job for 2-3 years and then applied for their masters.

What message would you like to give to future aspirants who want to crack such foreign universities?

Just enjoy your engineering journey. Always try to be creative and push yourself to new heights by always doing challenging tasks. Don't take unnecessary pressure if you have made it this far you will surely cross the line.

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We, the editorial and the creative committee of The Byte 2021 have worked hard with our heart and soul to bring to you the Annual Byte magazine which includes the technical articles which would inspire and expand the technological genius inside you!

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Regards,
The Byte Core

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OUR CREATIVE TEAM