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TELESCAN 2021 PRESENTS

AAROH

FUTURE FOCUSED TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION

We Are changing the world with Technology

VOL 11
SEPT 2021

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We are much honoured and happy to present you 'TELESCAN 2021', our Departmental Magazine. As TELESCAN is a technical magazine, it provides a platform to the students to express their advanced technical knowledge. Students get inspired to do study on latest technology before submitting their articles. It is surely beneficial for students. Although the online education has not been a new concept to educators in general, the COVID-19 pandemic introduced an unprecedented and global need to explore online teaching/learning opportunities within the entire spectrum of educational levels, In spite of online mode this year too we have got good response from students.

We would like to thanks principal Dr. P.B. Mane & HOD , Dr. M.P. Sardey (HOD) for their support and encouraging us to represent such a wonder. With support of whole department, we have made our best to make TELESCAN the gem.

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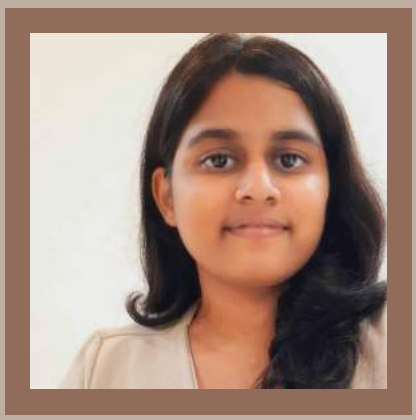

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VISION OF E&TC DEPARTMENT

To provide quality education in electronics & telecommunication engineering with professional ethics.

MISSION OF E&TC DEPARTMENT

To develop technical competency, ethics for professional growth and a sense of social responsibility among students

Programme Educational Objectives

1.To provide graduates of the program with pertinent skills to boost employ-ability and all round development.
2.To empower graduates of the program to exhibit professionalism and adopt lifelong learning in the emerging areas of technology.
3.To prepare graduates of the program to evolve as socially committed entrepreneur's sensitive to the needs of the society.

Programme Specific Outcomes

1.Apply domain specific knowledge to develop electronics and telecommunication systems/applications.
2.Select different software tools, test and measurement equipment and use them efficiently for system solutions.

Programme Objectives

Graduates will be able to

1.Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems,
2.Problem analysis: identify, formulate, research literature, and analyse complex engineering problems. reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. Design/development of solutions: Design solutions for problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4.Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions,
5. Modern tool usage: Create, select, and apply appropriate techniques resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10.Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leadering team, to manage Projects and in multidisciplinary environments.
12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

WHY IS THE MAGAZINE NAMED AAROH?

AAROH,
the dictionary meaning of AAROH indicates to the one having high qualities as a mountain.

In this developing world quality plays an important role in our life which include wealth, employment, the environment,
physical and mental health, education, recreation and leisure time, social belonging, religious beliefs, safety, security and freedom.
So, we believe that everyone should possess these qualities to achieve great heights in their lives.

So presenting you आरोह,

आ–आज़ाद
रो–रोशनी
ह–हौसला

#ENHANCE THE WAY OF LIVING

The meaning of आरोह defined by TESA is to add quality to the creative minds of India and enhance the way of living.

IN THIS ISSUE

INDUSTRIAL IOT

In today's world where new technologies are introduced every day, it becomes necessary for us to cope up with it. Well, today let us talk about one such concept we need to cope up with. Firstly, we all are aware of the term IoT, which can be defined in simple words as a network which can be used to connect devices to the internet for carrying out various tasks avoiding human intervention. So, not to get confused with it. i.e. Industrial IOT (IIOT) or famously known as industry 4.0 is referred to an industrial framework whereby a large number of devices or machines are connected and synchronized through the use of software tools and third platform technologies in a machine-to-machine and internet of things. These are nothing but machines, computers and people enabling intelligent industrial operations using advanced data analytics for transformational business outcomes. IoT and IIot have although a lot of common things like the connectivity or cloud platform but IoT applications connect devices across multiple verticals, including agriculture, healthcare, enterprise, consumer and utilities, as well as government and cities whereas IIoT applications, on the other hand, connect machines and devices in such industries as oil and gas, utilities and manufacturing. The Industrial Internet of Things (IIoT) refers to interconnected sensors, instruments, and other devices networked together with computers' industrial applications, including manufacturing and energy management. This connectivity allows for data collection, exchange, and analysis, potentially facilitating improvements in productivity and efficiency as well as other economic benefits. The IIoT is an evolution of a distributed control system (DCS) that allows for a higher degree of automation by using cloud computing to refine and optimize the process controls.

Historically, at first, there were Industrial Automation and Control Systems (IACS). But with the new technologies evolving and the new adaption that the industry is making IIoT got into the zone and was introduced to bring a revolution. It makes the use of smart sensors and actuators to enhance manufacturing and industrial processes. It also uses the power of smart machines and real-time analysis to take advantage of the data that machines which in technical terms are dead or you can say dumb to utilize it. We can use it for quality control, green electronics industry, energy management industries and many such applications. We are using it for robotics, smart home automation, communications systems, power utility. An example can be A smart home where the music system senses the mood of a person and plays a particular genre.

A question that arises is how will it work or how it functions. So, there can be intelligent devices connected to various other devices or sources which will look after the error, analyze and exchange the data. You can say it might consist of various intelligent sources or devices, data communications that can be in a way private or public source for business information and lastly nothing but people.

Why is it of advantage is that it has predictive maintenance that is we can predict, analyze the real-time data also, to predict defects in machinery, for example, before they occur, enabling companies to take action to address those issues before a part fails or a machine goes down. In less than twenty years we have seen the evolution of IoT to IIoT. The potential of this technology is evident. However, we can only imagine how it might continue to change and redefine the way we live and work over the period of the next twenty years. That is why it's essential for industry leaders—and SMEs hoping to become legitimate players—to consider how IIoT is remaking the foundations of the industry. This is especially important in the age of "big data." As more and more connected devices lead to a constant accumulation of complex raw data, soon companies will have little choice but to rely on AI and edge computing to pre-process and analyze it. .There is a various vendor in the field like the Ability by ABB, a power and robotics company, IoT System by Cisco, a networking company, Field by Fanuc, a supplier of industrial automation equipment, Predix by GE Digital, an energy management company, Connected Performance Services by Honeywell, a software-industrial company and many more such companies.

Many companies have predicted that the growth of these is going to increase to a new level. Bain & Company predicted industrial IoT applications will generate more than $300 billion by 2020, double that of the consumer IoT segment ($150 billion).

This is due to the advantages such as Improved operational efficiency, Increased productivity, Enhanced customer experience.

In short IIOT concept is one of the most emerging concepts and dealing with it can be very recommendable in the future. Every pursuing engineer must be well compatible with its knowledge.

Article by: Krishna Mitesh Shah (BE)

ELECTRIC VEHICLES: CHARACTERISTICS AND ENVIRONMENTAL IMPACT

Abstract- Electric vehicles are a key technology in reducing future emissions and energy consumption in the mobility sector. The focus of this article is to review and assess the efficiency and the environmental impact of battery electric cars (BEV), which is the only alternative on the market available today to vehicles with internal combustion engine (ICE).

Introduction- Worldwide 26% of primary energy is consumed for transport purposes, and 23% of greenhouse gas emissions is energy-related. According to the WHO, air pollution is a major environmental risk for health and is estimated to cause approximately two million premature deaths worldwide per year. In order to meet future mobility needs, reduce climate as well as health relevant emissions, and phase out dependence on oil, today's propulsion technologies have to be replaced by more efficient and environmentally friendly alternatives like "Electric vehicles" for the greater good.

Objective- The main objective to switch from an ICE vehicle to EV is to reduce the environmental impact of fossil fuels on our planet. Although initial cost of an EV is comparatively high the advantages outweigh minor disadvantages. Adopting EV's will vastly help India to decrease the extreme expenditure on import of oil as India imports 96% of its oil.

Advantages-

1) Lower fuel costs EV's use electricity instead of gasoline. Currently, electricity is cheaper than gasoline, and charging overnight can save consumers even more.

2) Numerous tax rebates and subsidies are available As of today, many states in India have subsidies on the purchase of EV's. Some states have dismissed the initial registration cost of EV's

3) Good for the environment EV's are classified as one of the next-generation of eco cars characterized by their low environmental impact. Since no exhaust gases containing carbon dioxide or air pollutants are emitted, they are expected to contribute to the prevention of global warming.

Disadvantages of EV's- EV's do present some drawbacks for consumers, however.

1) Charging equipment required Practical operation of EV's requires charging facilities. Although public charging stations are available, installing a charge system at home is necessary to ensure there is adequate charge for daily use.

2) Shorter cruising distance than gas-powered cars The cruising distance of EV's is limited by the capacity of the onboard batteries. Manufacturers are working to improve travel range by improving battery and conversion efficiencies.

3) Fewer models The number of EV models is far fewer than standard cars, which inherently limits the range of available functions and designs.

Conclusion- Findings of the article confirm that the electric vehicles can serve as a suitable instrument towards a much more sustainable future in mobility.

Article by: Abhishek Kurmelwar (BE)

DEVELOPMENT OF ELECTRIC VEHICLE IN INDIA

With the new emerging Technologies and vast development in the upcoming Technology and to keep up with ongoing advancement, India has given a green signal to the launch of Electric Vehicle (EV) all over the country. This launch of Electric Vehicle in India will be tremendous beneficial in terms of saving our environment and preserving it.

In 1996, the first electric vehicle was launched in India which was a three-wheeler by Scooter's India Pvt Limited named Vikram Safa, and with this launch, slowly in the upcoming years it got a tremendous boost, and various automotive companies started working on it. Right now, automotive companies in India such as Hyundai, Mahindra, Mercedes, Tata Motors, have launched their EV's in India, and are planning to launch more EV's with more benefits and innovations.

Basically, an Electric Vehicle is a battery car consisting of different motors and batteries fixed in it. There are two types of EV's- Battery Electric Vehicle and Plugin Hybrid Electric Hybrid Vehicle. The EV's are designed prominently for fuel economy, and to reduce emissions. Normal vehicles need an engine, but EV's doesn't require this, instead components like motor, battery, on-board charger and an electric power control unit are installed in the EV. This helps in effective cost saving. Electric cars work by plugging into the charging point and gradually store electricity in rechargeable batteries.Most of EV's use Lithium-ion batteries which have an edge as compared to other batteries used in traditional vehicles. Lithium-ion batteries are high energy density, longer life span and more durability. Electric motors used in EV's can be of three types such as BLDC, brushed DC and Ac induction motor. Since mechanical energy is derived from electricity, Motor helps in this conversion of energy. EV's are much more efficient than fossil fuel vehicles and have very few direct emissions. The batteries can be charged with DC power, but most of the EV's consist on an on-board AC-to-DC converter, because of which it helps charging of batteries through normal household AC power supply.

The burden of oil imports for India and excessive rise in the rates of petrol and diesel have a tremendous impact on the minds of the individuals to switching to Electric Vehicles. Right now, India is the fifth largest in the automotive industry, but with the emerging trend of electric vehicle and adaption of latest technologies in India, it has been predicted that India will be the third largest country in the automotive industry by 2030. India will lead all other countries by bringing in the largest production of EV's because of numerous advantages such as better logistics, business facilitation through easier and convenient ways, supply chain connectivity, etc.

Major benefits of using and promoting the use of Electric vehicles in India will be improving air quality, which will in turn result into better health of mankind. A single Electric car can save an average of 1.5 million grams of CO_2. Use of EV's in India is gradually proving to be beneficial to the country through various aspects.

Thus, by promoting the use of Electric Vehicles in India and by giving our small contribution in conservation of environment will tremendously take India reach heights of success. This change is going to contribute huge in the future scope and generation. Therefore, an environment with tons of natural oxygen will be sure the future of India by using eco-friendly products and gadgets that are innocuous.

Article by: Swapnali Limaye (BE)

WHY DO NEARLY ALL SUPER COMPUTERS RUN LINUX?

What does it feel like to operate Supercomputer?

ENIAC, even if it wasn't very super by today's standards, as when it was constructed, it was the fastest computer on the planet. And since it was the first electronic stored-program computer, it was basically the first system to be the fastest computer on the planet. Supercomputers are used for so many incredible things such as Aerodynamics, Fluid dynamics, Particle physics, etc. Most supercomputers have a very large numbers of processors and Linux can be configured to work very well with oodles of processors. Back in the 90s IBM became convinced that Linux was their future. They transitioned from their proprietary OS and began contributing to the open-source Linux development. In 1999 IBM bought, which was a leader in large-scale multiprocessing and Non-Uniform Memory Architecture (NUMA). Sequent's technology was impressive, while Sequent's Unix-based OS exhibited almost linear increase of performance up to the hardware limit of 64 cores. Now owned by IBM, the ex-Sequent engineers rolled their large-scale technology into Linux.

So, Linux became hot stuff in supercomputers. Windows runs on large-scale computers, but as many virtual machines rather than one over-arching OS. Multiple instances of Windows run, each thinking it has only a handful of cores. These days one has a login account somewhere, so you log in with secure shell and get a terminal session. You compile and link your program, and make sure that all the data files needed are properly accessible and loaded on the parallel filesystem. You double check your batch script, which contains the detailed instructions for job size, layout, runtime limits and so forth. These multiple instances can do a lots of individual things, but they can't cooperate on a single, large problem like Linux can. Windows suffers from diminishing returns, although the number of cores it can use effectively has gone up.

Linux can run on a full-GUI workstation, a mobile device (Android runs on top of Linux) or a bare board with no UI at all. It can be stripped down to the barest essentials. It can be custom-built to have ONLY the features you need and support ONLY the hardware you have. It's flexible. And because it's open-source, if there's an issue, you can look at it or have other, capable developers look at it.

Back in the 2.0 kernel era (when I was in college), it was not uncommon for me to custom-build my Linux kernel. My machine was a dual Pentium Pro with 48 MB of RAM. The stock kernel provided by most distributions has a ton of stuff in it about which I didn't care and I was trying to squeeze more functionality and performance out of my system. A custom-built kernel had less "overhead" in RAM and less CPU usage. I, later, went with the Gentoo distribution which not only custom-built the kernel, it custom built the UI, the mail system, the web server, the video player ... everything, based on a handful of parameters which I provided about my system. I was able to squeeze a surprising amount of functionality and life out of that system.

Article by: Athul Pillai (BE)

DATA SCIENCE

WHAT IS DATA SCIENCE ???

Data science is the field of study that combines domain expertise, programming skills, and knowledge of mathematics and statistics to extract meaningful insights from data. More and more companies are coming to realize the importance of data science, AI, and machine learning. Data science practitioners apply Machine learning algorithms to numbers, text, images, video, audio, and more to produce Artificial intelligence (AI) systems to perform tasks that ordinarily require human intelligence
Amazon is a prime example of just how helpful data collection can be for a average shopper. Its datasets remember what you have purchased , what you have paid , what you have in your cart, wish list . Data Science enables the companies for better decision making , predictive analysis and pattern discovery . It lets you
·Find the leading cause of a problem by asking the right questions
·Perform exploratory study on the data
·Model the data using various algorithms
·Communicate and visualize the results via graphs, dashboards, etc.

Prerequisites for Data Science

Here are some of the technical concepts you should know about before starting to learn what is data science.
1. Machine Learning
Machine learning is the backbone of data science. Data Scientists need to have a solid grasp on ML in addition to basic knowledge of statistics.
2. Modelling
Mathematical models enable you to make quick calculations and predictions based on what you already know about the data. Modelling is also a part of ML and involves identifying which algorithm is the most suitable to solve a given problem and how to train these models.
3. Statistics
Statistics are at the core of data science. A sturdy handle on statistics can help you extract more intelligence and obtain more meaningful results.
4. Programming
The most common programming languages are Python, and R. Python is especially popular because it's easy to learn, and it supports multiple libraries for data science and ML.
5. Databases
A capable data scientist, you need to understand how databases work, how to manage them, and how to extract data from them from websites or APIs.
Skills required for career in Data Science.

1) **Data Analysis : R , Python , Statistics.**
2) **Data Visualization: R , Python Libraries.**
3) **Machine Learning : Python , Algebra , ML algorithms etc.**
4) **Data Warehousing : ETL , SQL , Hadoop , Apache , spark**

Jobs/In demand Careers in Data Science.

1)Data Scientist

Data scientists will need to be able to analyze large amounts of complex raw and processed information to find patterns that will benefit an organization and help drive strategic business decisions. Compared to data analysts, data scientists are much more technical

2) Machine Learning Engineer

Machine learning engineers create data funnels and deliver software solutions. They typically need strong statistics and programming skills, as well as knowledge of software engineering.

3) Machine Learning Scientist

Research new data approaches and algorithms to be used in adaptive systems including supervised, unsupervised, and deep learning techniques.Machine learning scientists often go by titles like Research Scientist or Research Engineer.

4)Data Analyst

Transform and manipulate large data sets to suit the desired analysis for companies. For many companies, this role can also include tracking web analytics and analyzing A/B testing. Data analysts also aid in the decision-making process by preparing reports for organizational leaders which effectively communicate trends and insights gleaned from their analysis.

5)Business Intelligence (BI) Developer

BI developers design and develop strategies to assist business users in quickly finding the information they need to make better business decisions.

6)Data Architect

Typical Job Requirements: Ensure data solutions are built for performance and design analytics applications for multiple platforms. In addition to creating new database systems, data architects often find ways to improve the performance and functionality of existing systems.

APPLICATIONS OF DATA SCIENCE:

1) Health care
2) Image Recognition
3) Recommendation Systems
4) Logistics
5) Gaming
6) Fraud Detection
7) Banking
8) Finance

Article by: Adarsh Veer
(TE)

HOW AUGMENTED REALITY, VIRTUAL REALITY& EXTENDED REALITY CAN TRANSFORM ONLINE EDUCATION

These Immersive technologies have the potential to take learning beyond the traditional online learning experience. With benefits such as enhanced engagement, improved retention and experiential learning, this simulation-based technology has the potential to revolutionize how online training programs are performed.

Traditional Method of Learning :

In a traditional classroom or lecture, you learn by listening to your teacher and talking to classmates. Studying for tests, sitting in lectures and trying to visualize through a textbook is the typical classroom experience Virtual reality can be used to enhance student learning and engagement. VR education can transform the way educational content is delivered

Here are some of the benefits of experiential learning with VR:

Scale learning experiences: Technologies such as science labs are amazing - they allow students to understand how things work based on practical experience.

Learn by doing:

VR in education provides an experience anchor to the instruction. With VR education, learners are inspired to discover for themselves. Students have an opportunity to learn by doing rather than passively reading.

Learn experientially for effective learning

Experiential learning is a process of learning through first-hand experience. It's a method of gaining expertise and skills through the practical application of concepts, theories and problem-solving techniques instead of just reading or hearing about them.

With these Technologies, students become more interactive as they get hands on practical experience. If traditional learning methods focus on theories, VR and AR focuses on implementations of practical application that can be practiced. By using these technology students get to experience which makes them more curious and interested in the subject. These Emerging technologies have the uniqueness that can affect the learning experience.

Article by: Saee Ghule
(BE)

ROBOTICS

What is Robotics ?

Robotics is the design, development, and utilization of machines and machine systems that perform a function or task that previously required a human being. While people often think of robots that look similar in shape and size to humans, robots can be significantly different, from small mobile vehicles and drones to mechanical arms that can grasp, move, and manipulate objects and tools. Robotics encompasses electronics design, mechanical engineering, and complex computer programming. Common applications of robotics are found in manufacturing, especially in repetitive or hazardous situations that could be life-threatening for human beings. Robots are also involved in everything from helping with home maintenance, chores and upkeep, performing surgery, automated transportation, and even as human companions.

The five major fields of robotics :

The five major fields of robotics are operator interface, mobility, manipulators and/or effectors, programming, and sensing.

1) Operator interface, is essential because a robot must have a system designed for receiving instructions and communicating with the user.
2) Mobility covers ways movement can be achieved by robots. Techniques for this include wheels, appendages, and even propellers.
3) Manipulators and effectors, refers to how robots may interact with objects around them. These components may hold tools or act as tools to complete a function or task and can require complex engineering.
4) Programming , which controls the parts and components of a robot based on the commands from the operator interface.
5) Sensing, provides a robot with information about the surrounding environment in order to interact with it appropriately. Cameras, microphones, and other types of sensors can analyze the immediate surroundings and detect changes.

Future of Robotics in India :

With so many applications across diverse sectors, the robotics industry in India needs to push itself beyond the conventional segments and begin exploring emerging domains like education, rehabilitation and entertainment. A recent study by a job site has found that India has witnessed an increase of 186 % in the number of people looking for work opportunities in the robotics sector between May 2015 and May 2018. In the same period, job postings in the sector have shown a growth of 191%. These positive statistics clearly affirm that the country is treading on the right path with this technology. The future of robotics in India certainly looks bright and replete with potential.

Article by: Manasi Takalkar
(TE)

TACKLING PHISHING ATTACKS!

Phishing is a cyberattack in which malicious actors send disguised emails or text SMS with a suspicious link to their target. The message's purpose is to create a sense of urgency and compelling the victim to click on the link. After tapping on the link, the target is taken to a new website that looks like a legitimate website of the victim's bank or any other organization where the target does confidential business.

Here are the other primary phishing methods:
1)Smishing
2)Spear phishing
3)Pharming
4)Whaling
5)Search engine phishing

Here are some ways to detect phishing scams:-

·The email, SMS, or voice caller demands that private details be changed or filled in. If it seems to be coming from a bank or the tax authorities, this is particularly doubtful.
·The URL displayed in the email and the URL shown when you move over the link vary from each other.
·The "From" address in the email is an emulation of a valid address, particularly from a corporation.
·Layout and structure are distinct from what you usually get from a company. Perhaps the logo appears pixelated, or the buttons are of various colours. Or maybe there are odd paragraph gaps or additional spaces between phrases.
·There are links from obscure sources in the email that you were not anticipating.
·The site is not protected. Suppose you go forward and tap on an email link to enter your confidential details. Make sure at the start of the URL you find the "HTTPS" instead of "HTTP" and the lock icon.

Ways of avoiding phishing attacks:-

Phishing attacks are one of the most commonly used tools by hackers due to their simplicity and ease of the process. They might sometimes look harmless but may end up being extremely dangerous for individuals, websites, and organizations. Check out the best phishing prevention techniques to protect yourself from these scams.

1,Keep yourself up-to-date:-

Complete knowledge about all the new and old phishing methods is one of the best ways to protect yourself from these scams. When you know all fraudulent activities, it will become easy for you to detect that scam and protect yourself.

2.Click wisely :-

Do not tap on the links attached to the emails or text messages you receive from unknown sources. The messages may seem to be coming from legitimate organizations, but actually, they are a part of the phishing attacks. Also, avoid clicking on pop-ups or other links you see on various websites (even authentic sites).

3.Use firewalls and antivirus program:-

There are two types of firewalls – a desktop firewall and a network firewall. It would be best if you used both of these to protect yourself from phishing scams. An antivirus program detects and blocks the downloading of suspicious software via the Internet, USB flash, etc.

4.Confirm the site security:-

If you click on the link attached with the email, ensure that it is protected with SSL certificates. The site secured with SSL (Secure Sockets Layer) certificates has a lock icon, and its URL starts with "HTTPS" rather than an insecure "HTTP".

5.Do not give personal info:-

The best practice to safeguard your confidential information is to stop sharing it over the Internet. Your bank or any other organization will not ask you to provide such details by sending emails. Whenever you find such emails, block them immediately.

Article by: Adhav Aishwarya (BE)

BLUE BRAIN

Introduction

Human brain, the most valuable creation of God. The man is called intelligent because of the Brain, but we lose the knowledge of a brain when the body is destroyed after death." BLUE BRAIN"- The name of the world's first virtual brain. That means a machine that can function as human brain.

Is it really possible to create a human brain?

What is virtual brain?

Virtual brain is a machine that can function as brain. It can also take decision. It can think as a brain. It can respond as well as keep things in memory. Virtual brain can be used to upload contents of the natural brain into it. To keep the intelligence, knowledge and skill of any person for ever and remember things without any effort.

What is blue brain?

The IBM is now developing a virtual brain known as the BLUE BRAIN. It would be the world's first virtual brain. Within 30 years, we will be able to scan ourselves into the computers.

A very good example of utilization of blue brain is the case "short term memory". An another situation is that when a person gets older, then he starts forgetting or takes a bit more time to recognize to a person. For the given reasons we need a blue brain. It is a simple chip that can be installed into the human brain for which the short term memory and volatile memory at the old age can be avoided.

Uploading human brain

The uploading is possible by the use of small robots known as the nanorobots. These robots are small enough to travel through out our circulatory system. Traveling into the spine and brain, they will be able to monitor the activity and structure of our central nervous system. They will be able to provide an interface with computer that is as close as our mind can be while we still reside in our biological form. Nanobots could also carefully scan the structure of our brain, providing a complete readout of the connection. This information, when entered into a computer, could then continue to function as us. Thus the data stored in the entire brain will be uploaded into the computer.

Hardware and Software requirements

A Super computer, Memory with a very large storing capacity. Processor with a very high processing power. A program to convert the electric impulses from the brain to input signal, which is to be received by the computer and vice versa. Very powerful Nanobots to act as the interface between the natural brain and the computer. The Blue Brain has some 8,000 processors which map one or two simulated brain neurons to each processor, making the computer a replica of 10,000 neurons.

“Blue Brain” & Human consciousness

"Blue Brain" offers a better understanding of human consciousness. It's an actual computer brain' that may eventually have the ability to think for itself. When it was first fed electrical impulses, strange patterns began to appear with lightning-like flashes produced by cells that the scientists recognized from living human and animal processes. "It happened entirely on its own". This helped the scientists to understand the actual processing of the brain which gave rise to the concept of "Blue brain". Blue brain acts as a computer that would operate at inconceivable speeds simulate the human brain. A Blue brain aims to unlock the secrets of brain by using the brute power of a supercomputer.

Blue Brain Power

The human brain has 100 billion nerve cells that enable us to adapt quickly to an immense array of stimuli. Blue brain is a technology that uses "Blue Gene" a supercomputer capable of processing 228 TFLOPS. The main aim of blue brain is to build an software replica or template which could reveal many existing aspects of the brain circuits, memory capacity, and how memories are lost. The modeling is also able to work out best way to compensate and repair error circuits. The blue brain model can be used to detect and test treatment strategies for neurological diseases.

"BLUE BRAIN": AN ARTIFICIAL BRAIN COMES TO LIFE IN SWITZERLAND

The machine is beautiful as it wakes up - it means it works in a fine way when started. Nerve cells flicker on the screen along with that electrical charges are produced. This piece of hardware consists of about 10,000 computer chips that act like real nerve cells. The simulation was created at the Technical University in Lausanne, Switzerland, where 35 researchers participate in maintaining this artificial brain. It runs on one of the world's most powerful supercomputers. The goal is to build a much bigger electronic thinking machine -- one that would ultimately replicate the human brain. "Blue Brain" is the most radical attempt so far to investigate the mystery of consciousness.

Conclusion

We will be able to transfer ourselves into the computer at some point. Eventually aim of applying terrific computer power to the simulation of an entire brain and very soon this technology will be highly accepted whole over the world.

Article by: Saumya Gaur (TE)

DIGITAL JEWELLERY

The “Digital Jewellery” looks to be the next sizzling fashion trend of the technological wave. In the next wave of mobile computing devices, our jewelry might double as our cell phones, personal digital assistants (PDAs) and GPS receivers.
The combination of shrinking computer devices and increasing computer power has allowed several companies to begin producing fashion jewelry with embedded intelligence. Today, manufacturers can place millions of transistors on a microchip, which can be used to make small devices that store tons of digital data. Digital Jewelry appears to be one of the biggest growing promotions of its time. Imagine being able to email your boss just by talking into your necklace. The whole concept behind this is to be able to communicate to others by means of wireless appliances. The other key factor of this concept market is to stay fashionable at the same time. Here are the pieces of computerized-jewelry phone and their functions:

Earrings – Speakers embedded into these earrings will be the phone’s receiver.

Necklace – Users will talk into the necklace’s embedded microphone.

Ring – Perhaps the most interesting piece of the phone, this “magic decoder ring, is equipped with light-emitting diodes (LED's) that flash to indicate an incoming call. It can also be programmed to flash different colors to identify a particular caller or indicate the importance of a call.

Bracelet – Equipped with a video graphics array (VGA) display, this wrist display could also be used as a caller identifier that flashes the name and phone number of the caller. The use of wearable devices has been growing enormously in today’s world. When you compare the size of electronics devices today with that of what it was ten years back, you can think about the kind of advancements happened in the world of technology. It may happen that by the end of the decade, we could be wearing our computers instead of sitting in front of them. Digital jewelry, designed to supplement the personal computer, will be the evolution in digital technology that makes computer elements entirely compatible with the human form.

Article by: Alisha Ibushe (BE)

SUCCESSFUL INDUSTRIAL 5G HINGES ON TESTING

The global rollout of 5G, the successor to the fourth generation of telecommunications network technology, is already having a major impact on industry.
The improved speeds and reliability that the 5G network can offer help make IoT and other internet-heavy industrial applications much more practical than they could be with 4G alone. While the technology can provide serious benefits over other options, performance testing new 5G applications will likely be just as essential. Effective testing strategies will be necessary for the designers of new, 5G-compatible IoT devices.

How 5G Is Enabling New Industry 4.0 Technology

The high speeds, improved connection strengths, and new technology, like massive MIMO, offered by 5G make it a highly effective option for connecting large industrial IoT fleets to the internet.

Combined with other networking strategies, like Wi-Fi and wired connections, 5G provides a great deal of flexibility to factory managers wanting to implement IoT technology.
These IoT fleets can include sensors that enable remote operational monitoring, components for remote access or control of machinery, and new robotics. These robots are sometimes called cobots, and they can work in close proximity with human workers and manage tasks like machine tending. Or they may be autonomous mobile robots (AMRs), which are self-piloting robots that use AI algorithms to perform repetitive but difficult-to-automate factory and warehouse tasks, like inventory picking.
Typically, the devices in these fleets need a continuous connection to the internet, and hundreds of devices or more could all be located in roughly the same area, meaning they'll all be served by the same cell tower or towers.

Why Testing Industrial 5G Applications Will Be Essential

The differences between 5G and 4G, along with changing industrial equipment, could have serious implications for how IoT devices perform when using a 5G network. Path loss, shadowing from environmental obstacles, and fast fading from multipath propagation can all impact signal propagation, for example.

The clustering of large numbers of IoT devices — enabled by 5G — can generate signal noise that may make connections less reliable. Thermal noise and broadband noise generated by industrial infrastructure like power supply lines may also impact the signal strength.
In some cases, 5G-compatible components may require entirely different testing strategies. Highly integrated packages of components like mm Wave antennas and radio frequency integrated circuits (RFICs) may not be testable with methods like wired testing, making over-the-air (OTA) testing even more important.

OTA testing was already necessary for some 4G devices, due to the introduction of massive MIMO technology. With 5G, the antenna array is even more crucial for device performance and can have a major impact on the function of device transceivers.

At the same time, businesses are facing new cybersecurity challenges. The decentralized network that 5G enables can also make devices on the network's edge more vulnerable to attack. Protection of data as it moves from device to device will become more important.
The testing of components like Wi-Fi transceivers will remain critical. Some features that are becoming increasingly essential for device components, like encryption and performance in noisy environments, will need to be tested before components are put into circulation.

Potential Testing Strategies for 5G and IoT

Technicians developing new IIoT devices and planning IIoT applications will need to develop solutions capable of instantly testing radiofrequency performance and troubleshooting the root causes of poor RF performance.

Performance testing will help ensure 5G-compatible IoT devices and components can function under expected operating conditions. These tests will prove 5G components can execute particular tasks or perform certain services in real-world operating scenarios.

Testing strategies, like the universal testing system developed by the 5G Alliance for Connected Industries and Automation (5G-ACIA), can provide guidance for how performance testing can be carried out.

With the right components, IoT device or implementation engineers could ensure testing parameters are consistent across all tests in a given test case, as well as controlled for all test cases in a test group. This ensures that measurement parameters can be recorded with some level of confidence in the reliability and consistency of measured results.

In the 5G-ACIA system, three components are used for testing. Passive environmental baseline parameters are reproduced by the testing system's radio channel. Application-related parameters are provided by a distributed automation system, and active environmental parameters are produced by an interference source. These three components can be physical or emulated by the testing system.

With this combination of testing components, it's possible to test a variety of desired functions in a range of environmental conditions.

How Testing Will Be Necessary for Effective 5G Implementation

5G offers a number of major advantages for the industrial sector, including faster speeds and improved connectivity for large IoT fleets. The upgrades that 5G provides, however, will also require a different approach to testing.

As the rollout of 5G continues and the use of industrial IoT grows, developers of IoT devices will need to prioritize testing to ensure their devices can handle operations in industrial environments.

Article by: Prasanna Argade (BE)

ENERGY MANAGEMENT STRATEGIES FOR PLUG-IN HYBRID ELECTRIC VEHICLES

ABSTRACT

Plug-in hybrid electric vehicles (PHEVs) differ from hybrid vehicles (HEVs) with their ability to use off-board electricity generation to recharge their energy storage systems. In addition to possessing charge-sustaining HEV operation capability, PHEVs use the stored electrical energy during a charge-depleting operating period to displace a significant amount of petroleum consumption.

PHEVs have the potential to reduce fuel consumption to levels even lower than those achieved by the commercially-available hybrid electric vehicles (HEVs) now manufactured by many major automakers. Current HEVs deliver efficiency improvements through means such as enabling the engine to shut off rather than idle, recapturing a portion of normally wasted braking energy, and permitting engine downsizing to improve average in use efficiency. While such hybridization benefits do improve the fuel economy of these vehicles, all of the available energy still comes from the fuel tank. PHEVs enjoy the same hybridization benefits as HEVs and also provide an opportunity for fuel switching—obtaining

Fuel switching provides an operating cost benefit as well as a national security benefit by reducing the amount of petroleum required by the nation's vehicle fleet. but have very large batteries and motors, limited range, and require several hours to recharge before reaching full range capability. The onboard fuel converter helps PHEVs mitigate these drawbacks and allows them to fall back on charge-sustaining (CS) HEV operation. However, until the PHEV exhausts the stored electrical energy obtained through its charging plug, an energy management strategy must decide how to best use both energy sources (fuel and stored electricity) in a charge depleting (CD) operating manner. We will discuss three different energy management approaches for this initial CD operating period,

AER-FOCUSED STRATEGY an AER-focused strategy seeks to operate the PHEV all electrically during roughly the full range of CD operation. During continued driving, the vehicle switches to CS HEV operation.

Before driving, the vehicle's fully charged energy storage system (ESS) begins at its maximum state-of-charge (SOC) The SOC drops during the CD operating distance as the vehicle drives electrically without assistance from the engine. Once reaching the CS SOC level, the SOC remains roughly steady while the engine and motor work together during CS HEV operation.

ENGINE-DOMINANT BLENDED STRATEGY An engine-dominant blended strategy uses the stored electrical charging energy to supplement engine operation, but spreads out its utilization so as to maximize system efficiency The vehicle may operate all-electrically during initial CD operation. However, the engine eventually turns on during the CD mode as soon as the driving demand becomes high enough.

ELECTRIC-DOMINANT BLENDED STRATEGY **An electric, ESS/motor-dominant blended strategy operates similarly to the AER-focused strategy. The key difference is that the control and component sizing do not prioritize achieving a substantial all-electric driving distance during CD operation.**

The choice of charge depleting operating strategy directly influences PHEV design decisions and the benefit derived from the technology. The AER-focused strategy requires larger and more expensive electric components, but offers all electric cycle operational benefits,. The engine-dominant and electric-dominant blended strategies do not achieve as great all-electric operation benefits, but are able to utilize smaller and less expensive electric components

Article by: Shivam Gosavi
(BE)

DARK NET

The dark net refers to encrypted networks on the Internet that are not indexed by search engines such as Google, Yahoo or Bing. It is a layer of the Internet accessible only by using special software like Tor (The Onion Router), or I2P (Invisible Internet Project).These are networks that are only available to a select group of people and not to the general Internet public, and only accessible via authorization, specific software and configurations. This includes harmless places such as academic databases and corporate sites, as well as those with shadier subjects such as black markets, fetish communities, and hacking and piracy.The terms "dark net" and "dark web" are occasionally used interchangeably, but with subtle differences in meaning. Dark net is a network built over the Internet whereas dark web refers to websites on a dark net.

Dark Net, Deep Web and Surface Web

"Dark net" is commonly confused with "deep web." The deep web refers to unindexed sites which are unsearchable; in most cases, this is because those sites are protected by passwords. Part of the WWW (World Wide Web) which is not indexed by a search engine like Google is Deep Web and it about 500-600 times larger than the surface web.

Surface Web -Also called the Visible Web, Indexed Web, Indexable Web or Lightnet -is that portion of the World Wide Web that is readily available to the general public and searchable with standard web search engines. It is the opposite of the deep web. It only constitutes 4-6% of the whole web.

Ø Usefulness of Dark Net

·To avoid Censorship: Individuals within closed societies and facing extreme censorship can utilize the dark net to communicate with others outside of their society.

·Anonymity and Secrecy: Even individuals within open societies may have some interest in using the dark net, particularly as concerns about government snooping and data collection continue to grow worldwide.

Useful for whistleblowers and journalists to maintain secrecy in communication and leaking and transferring information.

Ø Concerns Regarding Dark net.

·Facilitates Illegal Activities: A large portion of the activity which takes place on the dark net is illegal. The dark net offers a level of identity security that the surface net does not.

·Dark net is the virtual equivalent of a black market.

·Criminals looking to protect their identities in order to evade detection and capture are drawn to this aspect of the dark net. For that reason, it's unsurprising that a number of notable hacks and data breaches have been associated with the dark net in some way or another.

·The relative impermeability of dark net has made it a major haven for drug dealers, arms traffickers, child pornography collectors and other criminals involved in financial and physical crimes so much so that one can buy anything from tigers to hand grenades to any kind of narcotic substances, provided the potential buyer finds the right website on the dark net.

·One of the most famous examples of a dark network was the Silk Road marketplace. Silk Road was a website used for the buying and selling of a variety of illegal items, including recreational drugs and weapons. Although it was shut down by government authorities in 2013, it has spawned a number of copycat markets.
·Used by Activists and revolutionaries to organize themselves without fear of giving away their position to governments they oppose.

·Terrorists use dark net to provide information to fellow terrorists, to recruit and radicalize, to spread propaganda, raise funds, and to coordinate actions and attacks.

·Terrorists also use the dark net for illegal purchase of explosives and weapons, using virtual currencies like Bitcoin and other crypto-currencies.

·Security experts are claiming that hackers and fraudsters have started to offer access to SCADA and ICS systems via discussion forums on the dark web, potentially compromising vital infrastructure networks across the world.
SCADA systems are used to run facilities like nuclear power stations, oil refineries and chemical plants, so if cyber-criminals gained access to major networks, then the consequences could be lethal.
·Way forward
· Given the increased importance of cryptocurrencies in the financial world, it's possible that dark nets will become more of a feature for everyday Internet users in the future. In the meantime, they may also still provide criminals with a means of eluding capture, although true anonymity is never guaranteed, even when using encryption of the type found in these networks.

·Governments across the world should strengthen their Cybersecurity Framework to deal with the threats posed by dark net. They must cooperate with each other regarding securing the Cyberspaces worldwide through intelligence, information, technology and expertise sharing.

·India should invest enough in research and development and training and capacity building of personnel in the field of Cybersecurity.

Article by: Abhishek Ithape
(BE)

EMBEDDED SYSTEMS

An embedded system is a microprocessor-based system that is incorporated into a device to monitor and control the functions of the components of the device. An embedded system used in a device is programmed by the designers of the system and generally cannot be programmed by the end user.

Embedded systems possess the following distinguishing qualities:-

· Reliability: Embedded systems should be very reliable since they perform critical functions. Embedded system programmers should take into consideration all possibilities and write programs that do not fail.

· Responsiveness: Embedded systems should respond to events as soon as possible.

· Specialized Hardware: Since embedded systems are used for performing specific functions, specialized hardware is used.

· Low cost: As embedded systems are extensively used in consumer electronic systems, they are cost sensitive. Thus their cost must be low.

· Robustness: Embedded systems should be robust since they operate in a harsh environment. They should endure vibrations, power supply fluctuations and excessive heat.

Components of an Embedded System :

· Processor: A processor fetches instructions from the memory unit and executes the instructions. An instruction consists of an instruction code and the operands on which the instruction should act upon. The format of instruction code and operands of a processor is defined by the processor's instruction set. Performance of the system can be improved by using specialized processors. These dedicated processors implement algorithms in hardware using building blocks such as hardware counters and multipliers.

· Memory: The memory unit in an embedded system should have low access time and high density. Memory in an embedded system consists of ROM (only read operations permitted) and RAM (read and write operations are permitted). The contents of ROM are non-volatile (power failure does not erase the contents) while RAM is volatile.

· Peripherals: Peripherals are the input and output devices connected to the serial and parallel ports .of the embedded system. Serial ports transfer one bit at a time between the peripheral and the microprocessor. Parallel ports transfer an entire word consisting of many bits simultaneously between the peripheral and the microprocessor.

· Hardware Timers: The clock pulses of the microprocessor periodically update hardware timers. The timers count the clock pulses and interrupt the processor at regular intervals of time to perform periodic tasks.

· Software: Due to the absence of secondary storage devices in an embedded system, program code and constant data reside in the ROM. During execution of the program, storage space for variables is allocated in the RAM. The programs should execute continuously and should be capable of handling all possible exceptional conditions. Hence the programs generally do not call the function exit.

·With the recent developments in VLSI, the processor, memory, peripherals and the interfaces to the outside world are integrated into a single chip resulting in a microcontroller.

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Embedded Software Development

Programmers who write programs for desktop computers do their work on the same kind of computer on which their application will run. A programmer developing a program to run on a Linux machine edits the program, compiles it and debugs it on a Linux machine.

The programs developed for an embedded system are tested using the following tools:-

·Simulator: A simulator is software tool that runs on the host and simulates the behaviour of the target's processor and memory. The simulator knows the target processor's architecture and instruction set. The program to be tested is read by the simulator and as instructions are executed the simulator keeps track of the values of the target processor's registers and the target's memory. Simulators provide single step and breakpoint facilities to debug the program. Simulators cannot be used if the embedded system uses special hardware that cannot be simulated and the only way to test the program is to execute it on the target. Although simulators do not run at the same speed as the target microprocessor, they provide details from which the time taken to execute the code on the target microprocessor can be determined. For instance, the simulator can report the number of target microprocessor's bus cycles taken to execute the code. Multiplying this value with the time taken for one bus cycle Time-critical applications are written in assembly language while complex applications are written in a high level language. gives the actual time taken by the target microprocessor to execute the code.

·Emulator: An emulator is a hardware tool that helps in testing and debugging the program on the target. The target's processor is removed from the circuit and the emulator is connected in its place. The emulator drives the signals in the circuit in the same way as the target's processor and hence the emulator appears to be the processor to all other components of the embedded system. Emulators also provide features such as single step and breakpoints to debug the program.

Conclusion:

Embedded systems have requirements that differ significantly from general purpose computers. The main goal of an embedded system developer is to design a lowest cost system, that performs the desired tasks. without failing. Algorithms can be implemented in hardware or software. While the hardware. approach improves performance the software approach provides flexibility. Recent developments in hardware-software co-design permit trade-offs between hardware and software for cost-effective embedded systems.

Article by: Shubham Bhagawan Pisal
(TE)

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WHY CODE EFFECTIVELY?

Coding is one of the most popular practices in the modern era of technology. It is a highly prevalent skill that is considered to be one of the mandatory requirements for most of the popular fields that deal with software development or data analysis. Coding is essentially making your computer program understand your mental logic and enabling you to achieve the required task at hand. As we become more advanced in the field of programming, it becomes significant to understand the importance of writing efficient code. Python is one of the easiest programming languages to learn and get started with for most beginner-level programmers. Not only does it offer simplicity, but it also has a wide range of libraries to perform a variety of tasks making it one of the most versatile languages. It also allows the users to work in numerous fields such as Data Science, Artificial Intelligence, robotics, astronomy, and so much more.

Why Code Effectively?

During the beginner stages of a programmer, we tend to develop some habits that would enable us to receive the solution to a particular program or task in the easiest way possible. However, it is worth questioning that if this easy way of obtaining the answer is the most effective and efficient way to compute the following problem at hand. The requirement for effective and efficient code is a must. During the process of programming or creating simpler projects, there might not seem a necessity for such a practice. But as you grow more advanced and experienced, you will need to debug your code and test it in a systematic manner. You need to try to make your code more pythonic as well as ensure it satisfies the best requirements for space and time complexity. Let us assume a simple example to print a statement called "Hello" with a print statement five times. You can achieve this task with numerous methods. We will look at three such approaches that you can utilize for performing the same code and analyze how effective they are and how different each one of the following works. The first approach is to print the statement five times.

Approach-1:

```
print("Hello \n")
print("Hello \n")
print("Hello \n")
 print("Hello \n")
print("Hello")
```

The second approach is to print the statement once and use a multiplier to receive the desired output.

Approach-2:`print("Hello \n"*5)` **(OR)**

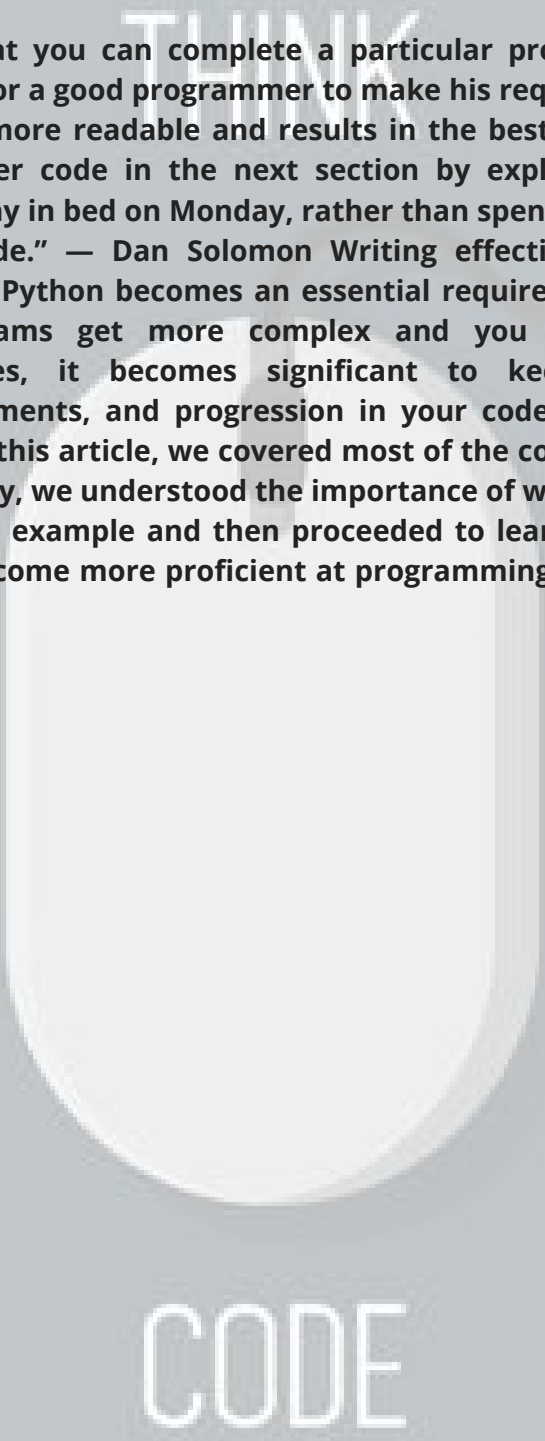
```
print("Hello \n"*5, end="")
```

The final approach that we will look at is to make use of a for loop for performing this action.

Approach-3:

```
for i in range(5): print("Hello")
```

It is easy to deduce that you can complete a particular program in multiple ways. However, it is essential for a good programmer to make his required code as efficient as possible such that it is more readable and results in the best outputs. Let us explore how we can write better code in the next section by exploring five crucial steps. "Sometimes it pays to stay in bed on Monday, rather than spending the rest of the week debugging Monday's code." — Dan Solomon Writing effective code for performing numerous operations in Python becomes an essential requirement as you progress in the field. When programs get more complex and you are limited with your computational resources, it becomes significant to keep making continuous advancements, improvements, and progression in your code to keep it relevant for future years to come. In this article, we covered most of the concepts that are required for efficient coding. Firstly, we understood the importance of why it is necessary to code effectively with a simple example and then proceeded to learn five primary practices that will enable us to become more proficient at programming no matter what level of learner you are.



Article by: Sukrut Kulkarni (BE)

WHAT ROLE WILL ARTIFICIAL INTELLIGENCE HAVE IN THE MOBILE-NETWORKS OF THE FUTURE?

The advent of 5G is introducing new challenges for mobile communications service providers, and integrating artificial intelligence (AI) techniques into networks is one way the industry is addressing these complexities.

Ericsson asked senior executives and decision-makers from 132 service providers all over the world about their current and future plans for adopting AI into their networks. This report examines how far providers have already implemented AI, shares the experiences and challenges they have encountered, and looks at their plans for future deployment.

Key findings

·AI is already being incorporated into networks, with a primary focus on reducing capital expenditure, optimizing network performance and building new revenue streams.

·AI will be vital for improving customer service and enhancing customer experience.

·AI will help recoup the investments communications service providers (CSPs) are making in their networks to switch to 5G.

·Adopting AI is creating new data challenges, even as it solves network complexities.

AI is being adopted into mobile networks by Communication service provider now:

Service providers from all over the world are already reaping the benefits of integrating AI into their networks. More than half of service providers (53 percent) expect to have fully integrated some aspect

f AI into their networks by the end of 2020. Some are even hoping to have adopted AI by the end of this year, with a further 19 percent estimating a timescale of 3to 5 years.

AI and customer experience:

Its 68 percent of service providers highlighted enhancing customer service as an overall business objective over the next 3 years, while 55 percent agreed that AI is already having a positive impact in this area. AI is expected to help providers further improve customer experience in many ways, including improving network quality and providing personalized services.

<u>Recouping the network investments that 5G demands</u>:

Lowering operational costs and ensuring returns on network investments are key priorities that service providers are looking to achieve using Artificial Intelligence.. 70 percent believe the highest potential return from AI adoption will be in their network planning, whilst 64 percent intend to focus their AI efforts on network performance management.

Data challenges presented by Artificial Intelligence adoption Network providers agree that they need to develop effective mechanisms for collecting, structuring and analyzing the huge volumes of data that AI is

capable of amassing. A key takeaway from the report is that the early

adopters of AI who find solutions to the challenges of today and tomorrow will have a clear first-mover advantage.

It is our belief that AI 5G will open up exciting opportunities for the mobile communications sector, as it can be utilized to create a more personal approach for customers, while helping to manage the costs of deploying and maintaining networks.

Article by: Vaishnavi Hambir Ghatage (TE)

QUANTUM COMPUTING

Quantum computing is the study of how to use phenomena in quantum physics to create new ways of computing. It is an area of computing focused on developing computer technology based on the principles of quantum theory. Another quantum property, called entanglement, allows for qubits to be quantum mechanically connected to other qubits in the system.

Nowadays computers can only encode information in bits that take value of 1 or 0, this restricts their ability, but quantum computing uses QUBITS. This unique ability of subatomic particles allows them to exist in more than one state. The power of quantum computers grows exponentially with more qubit. Quantum computing came into picture in 1980, when physicist PAUL BENIOFF proposed a quantum mechanical model of turning machine.

There are several types of quantum computing systems including the quantum circuit model, quantum turning machine and different quantum cellular automata.

Efforts towards building a physical quantum computer focus on technologies such as transmons, topological quantum computers, which aim to create high quality qubits. Quantum computing will enable industries to tackle problems they never would have attempted to solve before.

Currently IBM QUANTUM leads the world in quantum computing. This holds a lot of future scope and job opportunities. Quantum computing is a real skill set.

·Following are some of the applications :
·Cyber security.
·Drug Development.
·Financial Modelling.
·Better Batteries.
·Cleaner Fertilization.
·Traffic Optimization.
·Weather Forecasting and Climate Change.
·Artificial Intelligence.

Article by: SEJAL DEOLIKAR
(TE)

TECH QUIZ

1. If Facebook were a country, how big would it be in terms of population (members)?
A. 3 million
B. 1 billion
C. 1.4 billion
D. 7 billion

2. World-wide, what language is used the most on the internet?
A. German
B. English
C. Spanish
D. Chinese

3. TRUE or FALSE: Google is the second largest search engine.
A. True
B. False

4. TRUE or FALSE: More people in India speak English than in the United States.
A. True
B. False

5. When do Chinese students start learning English?
A. High School (9-12)
B. Middle School (6-8)
C. Elementary School (1-5)
D. Kindergarten

6. Twitter reported how many Tweets per day in June 2012?
A. 2 million
B. 400 million
C. 700 thousand
D. 1 billion

7. If Wikipedia were a book, how many pages would it be?
A. 1 billion
B. 400 million
C. 2 million
D. 200 thousand

8. How many Apps are available in the App store?
A. 7 billion
B. 700 million
C. 7 million
D. 700 thousand

9. About how many smartphones are being used in the world?
A. 1 million
B. 100 million
C. 1 billion
D. 100 billion

10. TRUE or FALSE: If Facebook were a country, it would have more people than India.
A. True
B. False

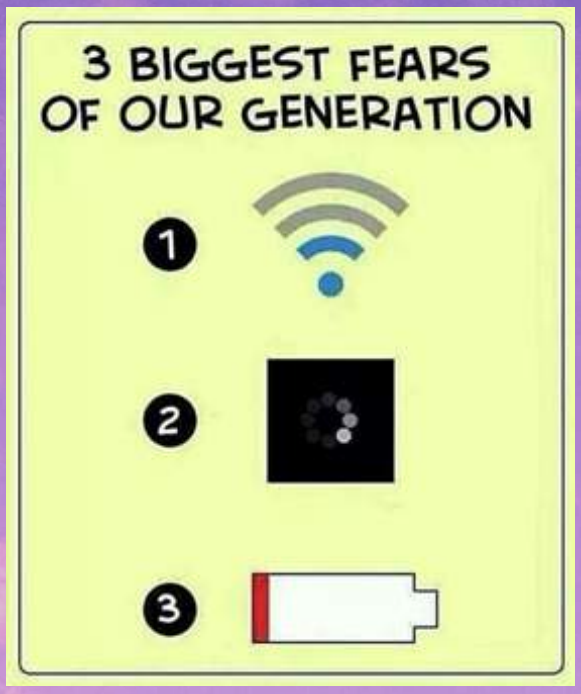
11.What was the first emoticon ever used?
A.😀
B.□
C.□
D.😜

12.What kind of malware is designed to take advantage of a security hole before it is known?
A. Zero-day exploit
B. Virus
C. Ransomware
D. Trojan horse

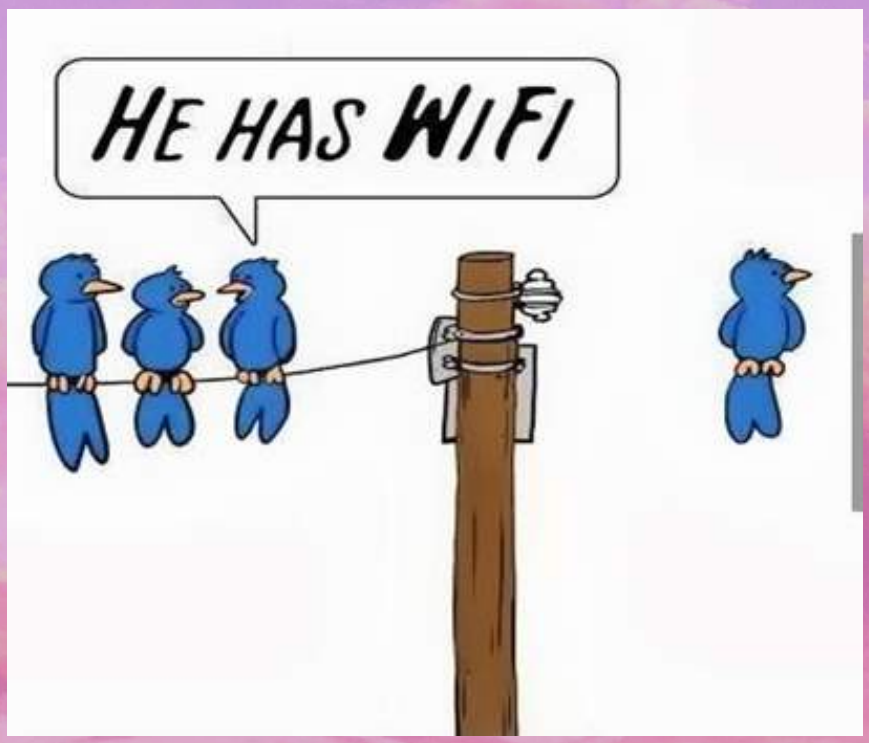
ANSWER KEY

1. **B**
2. **B**
3. **B**
4. **A**
5. **D**
6. **B**
7. **C**
8. **D**
9. **B**
10. **B**
11. **B**
12. **A**

TECH MEME


3 BIGGEST FEARS OF OUR GENERATION
1
2
3


"Classic Tech"
HEY KID, HAVE YOU EVER SEEN ONE OF THESE BEFORE?
WOW, COOL! YOU MADE A 3D MODEL OF THE SAVE ICON!
42
http://randomperspective.com/comic


HE HAS WIFI

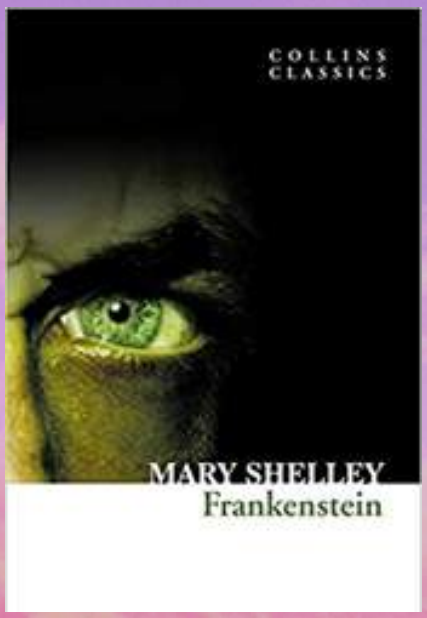
5 BEST OLD MUST READ SCIENCE FICTION BOOKS

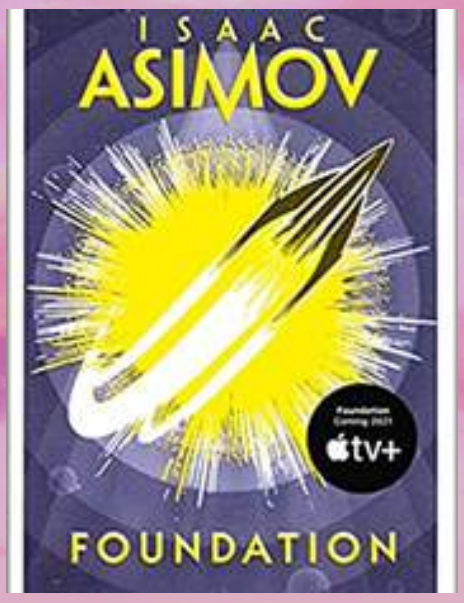
The Blazing World,
by Margaret Cavendish (1666)

This book is arguably the first science fiction book ever written.

Frankenstein,
by Mary Shelley (1818)

Frankenstein teaches an important lesson:
just because you can,
doesn't mean you should.





Foundation,
by Isaac Asimov (1951)

It's one of Elon Musk's favorite books

The Stars My Destination, by Alfred Bester (1957)

This landmark novel begins with a simple proposition – what if humans could teleport?

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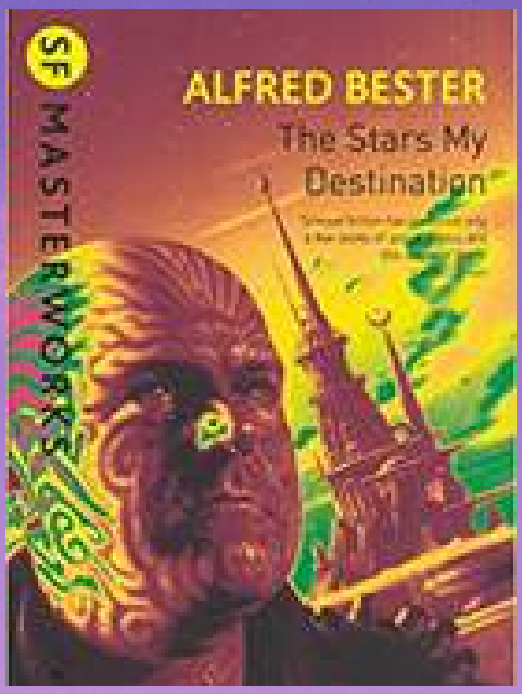

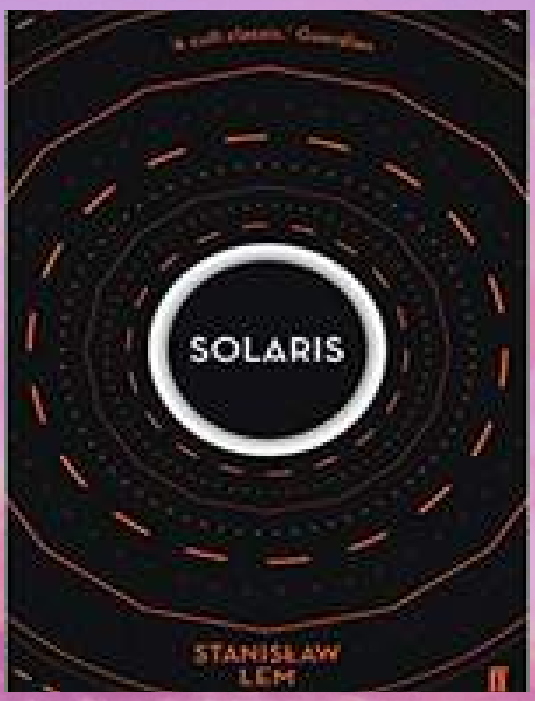

Solaris, by Stanislaw Lem (1961)

It follows a team of humans on a space station who are trying to understand the mysterious living ocean on the planet Solaris.