Qubit 2021

Developing Minds...

Dr. Akhilesh Das Gupta Institute of Technology & Management

Department of Computer Science & Engineering

MRS. ALKA DAS GUPTA (HON'BLE CHAIRPERSON)

Innovation requires passionate explorers who propel transformation at the workplace. With an ever-changing global scenario, the key to success is responding to the complex and rapidly changing issues in the world of information technology. The Department of Computer Science and Engineering of ADGITM is always making efforts to justify these points.

We impart an education that is based on consciousness and we rear a breed of young minds that are bustling with self-confidence, motivation, and ever ready to take up challenges. The campus, sports, and academic facilities all bear testimony to this effort. In order to promote an internationally acceptable education, our key focus has been on overall development.

Proficiency in computing technology has become essential for modern-day managers, business leaders, entrepreneurs, and other professionals. It is a welcome development. I look forward to QUBIT 2021 setting a higher pedestal.
I wish to QUBIT editorial team a grand success!

MR. VIRAJ SAGAR DAS (HON'BLE PRESIDENT)

I feel so delighted to find that the path of creativity and innovation is consistently followed by the Department of Computer Science and Engineering. It always encourages its students to actively participate and compete in various competitions and events to show their abilities towards the new platforms of technology.

A great part of the magazine is the fact that it brings us a bouquet of topics which are of utmost relevance and interest to all. It is a great pleasure for me to get to know all the activities and achievements of the Department of Computer Science and Engineering of Dr. Akhilesh Das Gupta Institute of Technology & Management in the form of such an interactive read.

I convey my best wishes for the success of QUBIT 2021.

MR. S.N. GARG
(CEO, ADGITM)

Through the guidance of trained and inspired leaders, the students are taken across the gap of their present knowledge and experience and place data level of knowledge and competence that enables them to immediately step into the high standard of efficiency required in today's world of development.

We aim to cultivate talents by closely nurturing them throughout the whole program. We are unique in terms of our programs, academic structure, and core values. Our students are our assets. We develop our students to open them up in front of global scholarly endeavours. While the whole world is running after chances, it is essential to create your own opportunity.

PROF. (DR.) SANJAY KUMAR (DIRECTOR, ADGITM)

In his book On Becoming a Leader, Warren Bennis wrote, "No leader sets out to be a leader. People set out to live their lives, expressing themselves fully. When that expression is of value, they become leaders. So the point is not to become a leader. The point is to become yourself, to use yourself completely - all your skills, gifts, and energies - in order to make your vision manifest. You must withhold nothing. You, must, in sum, become the person you started out to be and to enjoy the process of becoming."

We at Dr. Akhilesh Das Gupta Institute of Technology & Management believe in helping students to manifest their vision completely. How do we do this? We offer a rigorous education program rooted in all forms of practice, coupled with a vast array of electives and opportunities that come from our position of being affiliated with a major university. We give you the tools to continue learning and growing long after you leave our doors; we create opportunities for internships and experiences that broaden your horizons. I take this opportunity to express the fact that every effort is made to improve the existing best services to bring out the best for the welfare of our institution and the growth of our students.

DR. ANUPAM KUMAR SHARMA (HOD, CSE)

Once an author very rightly said that "Listen to the people who love you. Believe that they are worth living for even when you don't believe it. The Educational System of ADGITM is not limited to a defined curriculum only but to develop and cheer all the spheres of people especially students associated with

ADGITM's Department of Computer Science and Engineering always works in the direction of enhancement of Entrepreneurial abilities among the students and helps them in working on those relevant projects which can act as a landmark for our developing society. This Department is a cluster of some of the great scientific research fields which when together work upon gives wings to dreams to touch the sky of reality. Our department always works in the direction of innovation and technical knowledge enhancements so as to be a prestigious discipline covering every aspect from designing, simulation, analysis, and finally to production and testing.

Dr. Akhilesh Das Gupta Institute of Technology & Management

New Delhi

Department of Computer Science & Engineering

VISION

To produce technocrats, researchers, and entrepreneurs in the field of computer science and engineering who are socially responsible.

MISSION

M1. To provide quality education in the field of computer science and engineering with emphasis on research and innovations.

M2. To inculcate professional behaviour, strong ethical values, and leadership skills.

M3. To provide a platform for promoting entrepreneurship and multidisciplinary activities.

CONTENT


EVENTS

ALUMNI TALK

Anshul Mittal

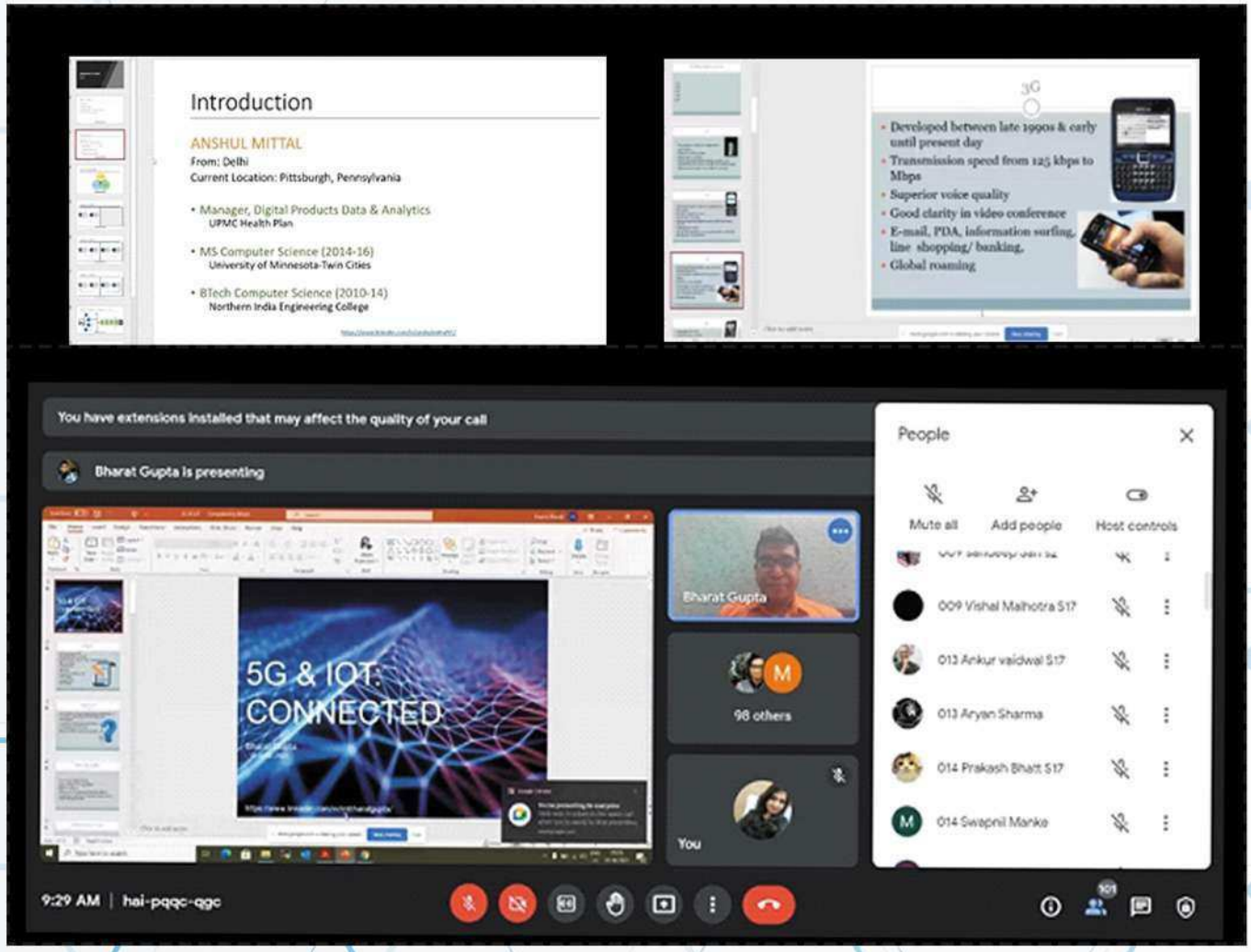
The Department of Computer Science & Engineering organized an Alumni Talk on 19th June 2021 by Bharat Gupta & Anshul Mittal Bharat Gupta an alumnus of batch 2010-2014, presently working full time at Capgemini Engineering (Formerly Altran) as Technical Lead in 45-5G COre Networks. He guided the students about consistently upgrading themselves both technically and domain wise. He enlightened students on the topic "IoT and 5G emerging trends in communication". He explained all the gaps in the previous generations starting from 1G.

Anshul Mittal an alumnus of batch 2010-2014, currently working as Manager Digital Data & Analytics, UPMC Health Plan(Pittsburgh,Pennsylvania).He shared his knowledge on the topic "Advanced Analytics". He explained about data science and guided students about different career options in this emerging field.

The event was successful, filled with an immense plethora of knowledge and positivity. 2nd and 3rd year students attended the session with full devotion and seeked guidance regarding career options in the field of both technologies.

Bharat Gupta

ALUMINI TALK EVENT



FACULTY DEVELOPMENT PROGRAMME

in collaboration with APTRON TECH PVT LTD, NOIDA

Date: 07-13 September 2020 **MODE: Online (Via Zoom)**

ADGITM hosted an online faculty development program in collaboration with Aptron Tech Pvt. Ltd, Noida on "Python Programming" from 7th September 2020 to 13th September 2020 via virtual platform Zoom.
Faculty members of CSE and IT department from ADGITM (Delhi), BBD (Lucknow), Wollo University (Ethiopia), BMIET (Sonipat), Vivekananda College, DU, Seshasayee Institute of Technology and Phd Scholars from Indian Institute of Teacher Education and IIT, Delhi participated in the session.

The major objectives of this programme was

- To enhance the knowledge on Python Programming including various concepts of data structures and object oriented programming.
- The conceptual learning from the basics of Python coding till the application oriented programming and file handling.

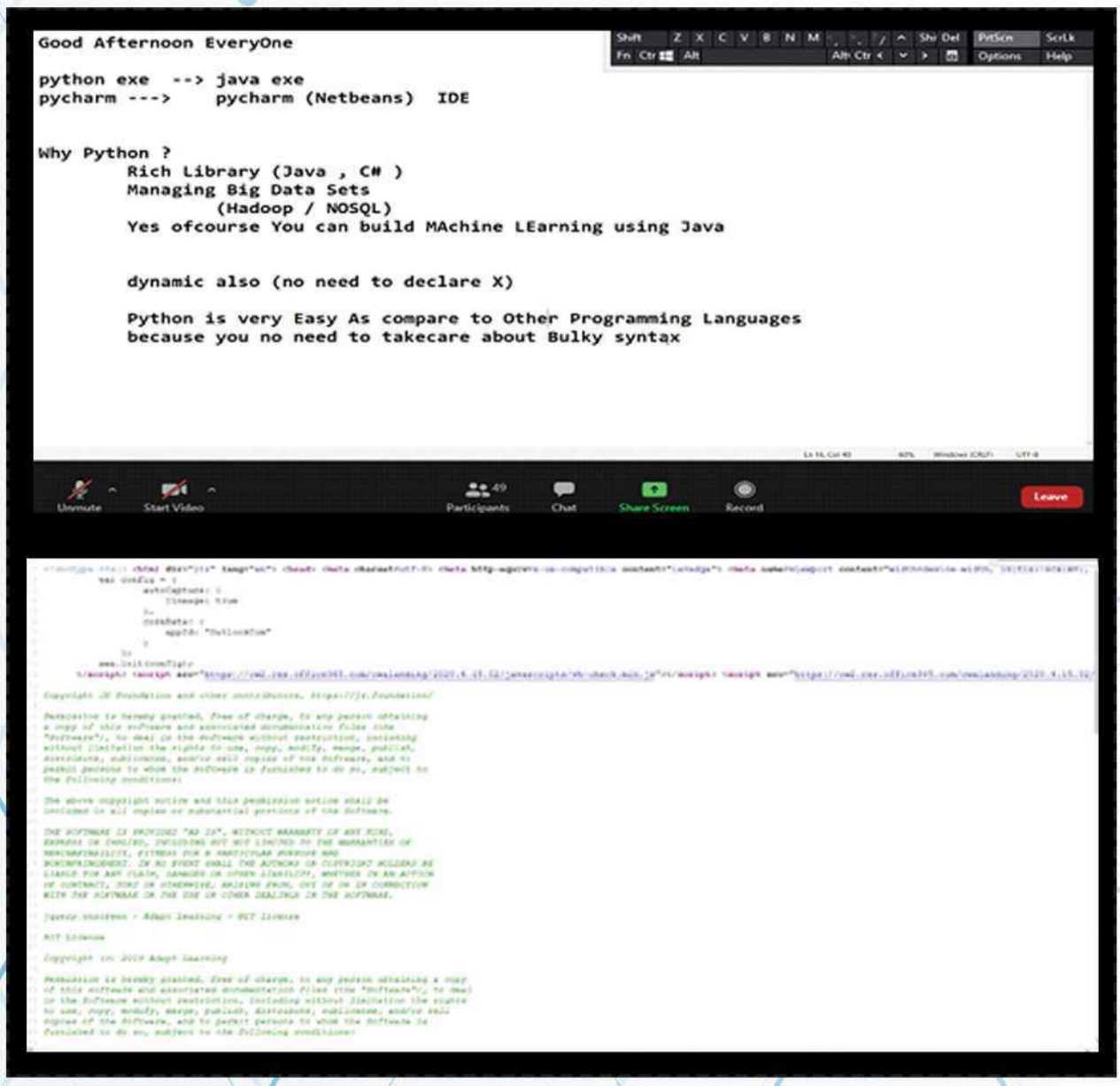
The major outcomes of this programme was:

On Day 1: Introduction of open source tools Pycharm & Anaconda.
On Day 2: Basics of Python and data structure.
On Day 3: Special Variables in Python, Loops, conditions and branching.
On Day 4: Code Reusability, creating modules.
On Day 5: Functional Programming in Python.
On Day 6: Object Oriented Programming concepts
On Day 7: Working with data storage system in Python e.i. CSV, SQL Database.


Dr. Akhilesh Das Gupta Institute of Technology & Management
(Formerly known as Northern India Engineering College)
Department of Computer Science & Engineering
Organizes
Faculty Development Program(FDP)
On
"Python Programming"
In Association with APTRON Technologies
Schedule : September 7, 2020 to September 13, 2020
Time : 3:30 pm to 5:30 pm
FDP Benefits:
*Training by Experienced Industry Expert
*e-Certificate to all the Participants
Faculty Coordinator:
Ms. Saakshi Agrawal - 9718466735
Email id: saakshi.agrawal@adgitmdelhi.ac.in
Register at : https://bit.ly/345JDP5
Last Date of Registration : September 5, 2020
https://adgitmdelhi.ac.in
WWW.APTRONNOIDA.IN


Microsoft Technology Associate
SUNNY SINGHAL
Introduction to Programming using Python
Microsoft


ORACLE
Certified Professional
This Certifies That
Sunny Singhal
Is Recognized By
The Oracle Certification Program As An
Oracle Certified Professional, Java SE 6 Programmer

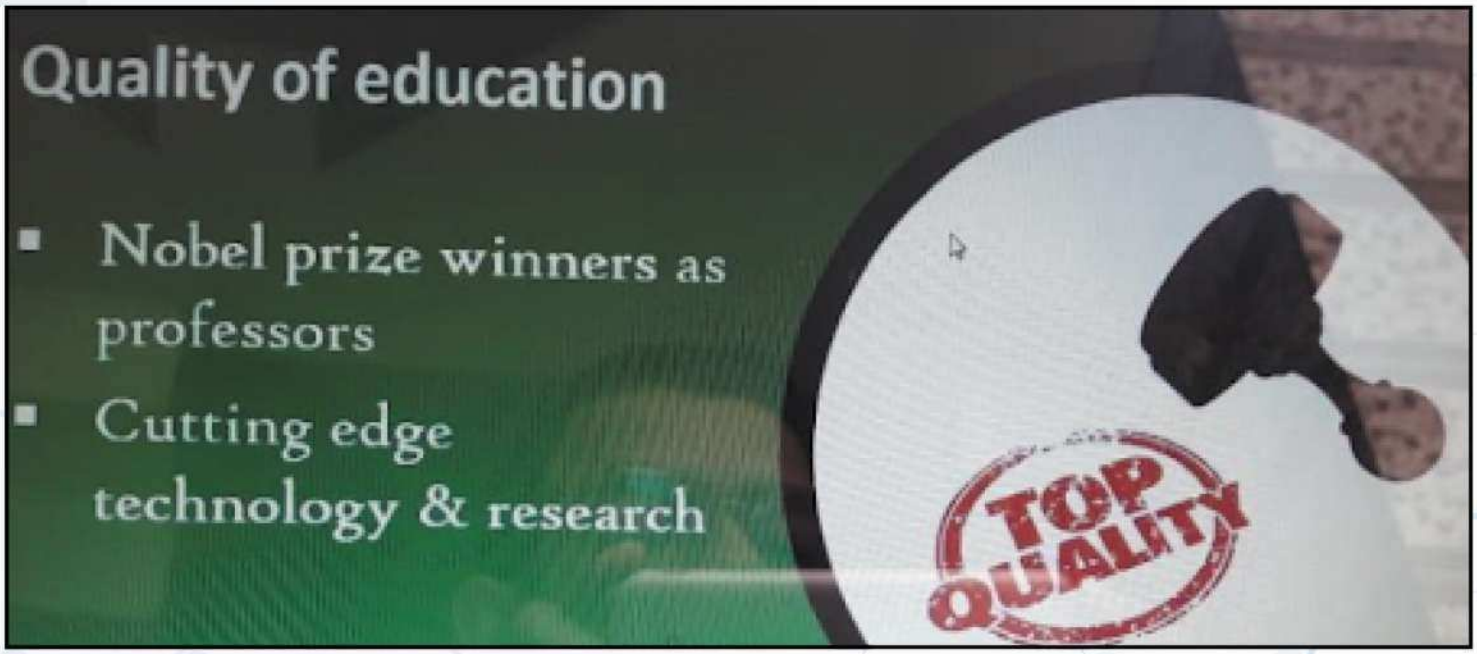

Good Afternoon EveryOne
python exe --> java exe
pycharm ---> pycharm (Netbeans) IDE
Why Python ?
Rich Library (Java , C#)
Managing Big Data Sets
(Hadoop / NOSQL)
Yes ofcourse You can build MAchine LEarning using Java
dynamic also (no need to declare X)
Python is very Easy As compare to Other Programming Languages
because you no need to takecare about Bulky syntax
Unmute
Start Video
Participants
Chat
Share Screen
Record
Leave

WEBINAR BY JAMBOREE EDUCATION PVT.LTD. ON "CAREER AVENUES THROUGH EDUCATION ABROAD IN POST COVID 19 SCENARIO"

-> On 5th April 2021, Jamboree Education Pvt.Ltd. hosted a Virtual interactive webinar to provide guidance on career opportunities and education abroad .

-> A total of 96 students attended the webinar by Mr. Arun Bhatia where he highlighted numerous domains with high job markets.

-> This webinar helped in clarifying student queries related to MS, PhD and MBA in various countries.



EXPERT LECTURE
ON "CLIENT SERVER ARCHITECTURE IN ERP SYSTEMS"

The Department of Computer Science and Engineering conducted a lecture for the second year students { S1, S2, and S17} on "Client Server Architecture in ERP systems" to enhance the knowledge on Client Server Architecture and provide insights on recent trends of ERP systems. The faculty coordinators for the session were Ms. Ekta Jain,Ms. Nishi Sharma.

Delegates (speakers, outsiders who attended the session): Mr. Anurag, Senior Dynamics AX Specialist

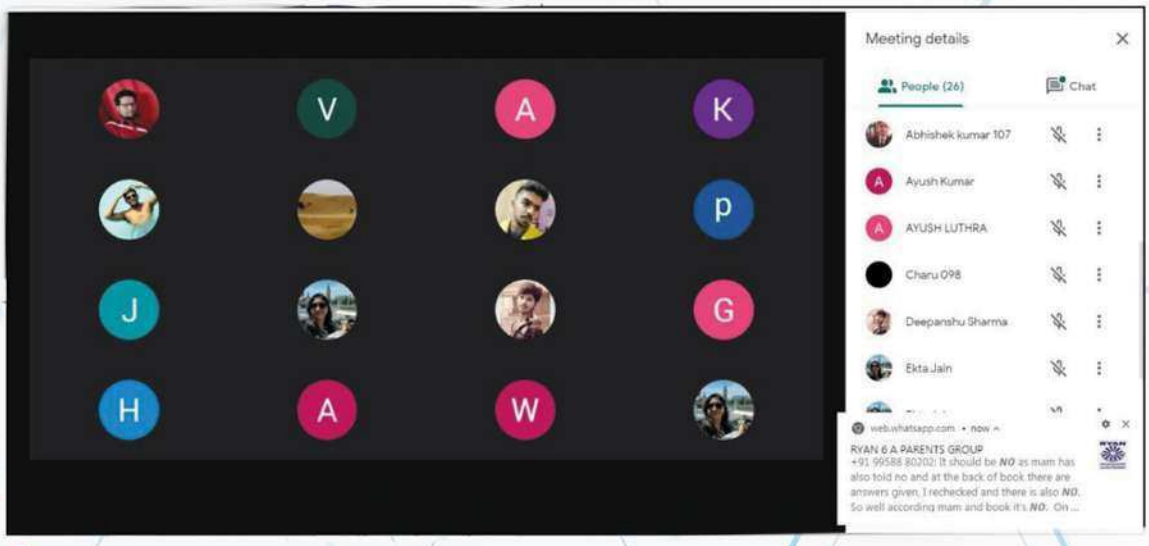
During the session students interacted with the AX specialist and were acknowledged regarding Client Server Architecture and its applications. It was an interactive session consisting of discussions and Q & A .

TOPICS HIGHLIGHTED WERE

1. Client server architecture
2. ERP systems
3. Microsoft ERP
4. 3 tier architecture

SESSION OUTCOMES

The knowledge regarding 3 tier client server architecture was delivered to the students. Architecture of ERP systems was also been shown with the help of presentations and examples.



EXPERT LECTURE ON "TOOLS AND TECHNIQUES OF MOBILE APP DEVELOPMENT"

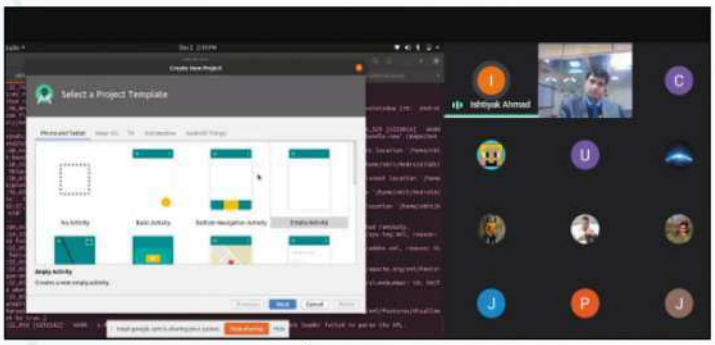
The CSE department organized a virtual session via Google meet for the third year students to enhance their knowledge about mobile app development along with demonstration of a sample app.

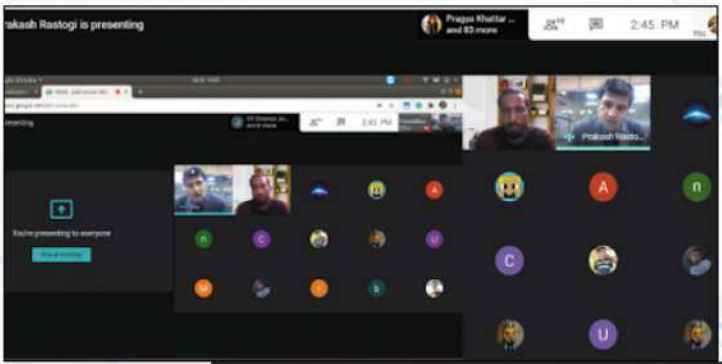
The session was delivered by Mr. Prakash Rastogi (Founder of VirtuBox Pvt. Ltd.) and Mr. Ishtiyak Ahmed (Developer).

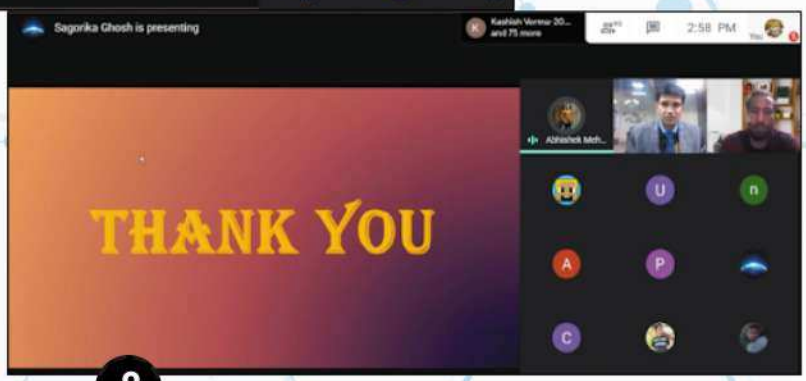
During this session a demo to design a mobile app was also given.

OUTCOME

Students enhanced their knowledge about various tools and techniques required to create Mobile apps using Java.







ACHIEVEMENTS

TECHNICAL EVENTS ACHIEVEMENTS

Atharv Jairath of the CSE Department participated in MLH Neighborhood Hacks and secured 1st position

Satyam Verma of the CSE Department participated in meme-thon organized by CodeChef ADGITM and secured 3rd position

Priyasha Gupta of the CSE Department participated in Vrikshit Foundation HR, an event for hiring volunteers for Vrikshit foundation contributing to successfully launching the project "Education for All" and secured 1st position

Kanika Bagri of the CSE Department participated in Smart Hacks, a programming quiz competition organized by IIT KANPUR under E&ICT Academy and secured 1st position

Samriddhi Jain of the CSE Department participated in CodeKaze, an event by Coding Ninjas, and scored 300/300 & secured 235th rank in this pan-India level online coding event and qualified for finals.

RESEARCH PAPERS PRESENTED

Vaibhav Sehgal of CSE department published a paper on "Emotional Analysis" in the
Machine Learning domain at International Journal of Creative Research Thoughts (IJCRT)

Jyoti Yadav of CSE department published a paper on "QR Captcha" in the AI domain at International Journal of Engineering Research & Technology (IJERT)

Alankrit Gupta of CSE department published a paper on "Regression Analysis of COVID-19 using Machine Learning Algorithms" in the Machine Learning and Data Science domain at IEEE Xplore via ICOSEC 2020 conference

B.Rakshana of CSE department published a paper on "An intricate decomposition towards the facets of Quality in IoT" in the ML and data science domain at the IEEE Xplore via ICOSEC 2020 conference

Aneerban Chakraborty of CSE department published a paper on "An intricate decomposition towards the facets of Quality in IoT" in Artificial Intelligence and Internet Of Things at IEEE Xplore via ICOSEC 2020 conference

Raghav Abrol of CSE department published a paper on "Database Forensics in open source database" at International Journal of Advances in Engineering and Management (IJAEM)

Tanisha Duggal of CSE department published a paper on "WebShark-The web dagger" in the CyberSecurity domain at International Journal of Advances in Engineering and Management (IJAEM)

Pranav Batra of CSE department published a paper on "Delineation of agents for games using deep Reinforcement learning" in the Deep learning domain at the IJERCSE

Rishabh Prasad Singh of CSE department published a paper on "Artificial Intelligence in medical and healthcare" at the International Journal of innovative science and research technology ISSN: 2456-2165 Volume 6- 2021, issue 1- January

Shivam goyal of CSE department published a paper on "Vehicle maintenance index implemented using whatsap Bot" in NLP at the International journal of advance in engineering and management ISSN-2395-5252

Aditya Agrawal of CSE department published a paper at the International journal organized by Elsevier (Parent body of Scopus)

Prateek Bansal of CSE department published a paper at Journal of Emerging Technologies and Innovative Research

Mohd Aaftab Qadri of CSE department published a paper at an event organized by Dr. Akhilesh Das Gupta Institute of technology and management

Varun Prakash of CSE department published a paper on Relative study of consensus algorithms at an event organized by the International Journal For Scientific Research and Development

Fahad Hassan, Soumya Roy, Mridula Prabhakar, Himanshu Rawat of CSE department published a paper at an event organized by Dr. Akhilesh das Gupta Institute of technology and management

Swagatika Giri, Gaurav Bhojwani, Nikhil Goyal of the CSE department published a paper on Instagram Automation at IJAEM

Himanshu goyal of the CSE department published a research paper on Real-time productivity analyzers. The paper is also Indexed in Google Scholar, Scribd, ISSN, DRJI, etc. Co-authors - Himanshu Goyal, Kanika Bagri, Vishal Kumar Singh, Eakansh Gupta, and Nishi Sharma Ma'am (mentor). The paper is published in - IJISRT

Shubham Gupta of the CSE department published a research paper at the IJIRST
Anubhav Kasturia of the CSE department published a research paper on TDD Mechanism at IJAEM

Sudhanshu Gupta of the CSE department published a research paper in the IJSRET journal

Ayush Madaan of the CSE department published a research paper on road detection and segmentation and published it in at an event organized by Dr. Akhilesh das Gupta Institute of technology and management

Faculty Articles

FLEXIBLE OLCD

-DR. ANUPAM KUMAR SHARMA (HOD, CSE)

FlexEnable's glass-free organic LCD (OLCD) delivers high-brightness, long lifetime flexible displays that are low cost and scalable to large areas, while also being thin, lightweight, and shatterproof. LCD accounts for more than 90% of displays sold today, but they are made with glass meaning that they cannot meet the conformability, thinness, and robustness requirements in many new applications. A new disruptive glass-free display technology – organic LCD (OLCD) – is now making high-quality, low-cost flexible displays available to all. It is manufactured on low-cost plastic substrates and uses inherently flexible, high-performance organic transistors instead of the rigid amorphous silicon transistors typically used in glass LCDs.

Why choose OLCD?

OLCD is a plastic display technology with full color and video-rate capability. It enables product companies to create striking designs and realise novel use cases by merging the display into the product design rather than accommodating it by the design. Unlike flexible OLED displays, which are predominantly adopted in flagship smartphones and smartwatches, OLCD opens up the use of flexible displays to a wider range of mass-market applications. It has several attributes that make it better suited than flexible OLED to applications across large-area consumer electronics, smart home appliances, automotive, notebooks and tablets, and digital signage.

Ultra-high contrast dual cell displays and Activating surfaces.

Advantages of plastic OLCD over glass LCD:

OLCD brings the benefits of being thin, light, shatterproof, and conformable while offering the same quality and performance as traditional glass LCDs. The mechanical advantages of plastic OLCD over glass LCD are further enhanced by the technology's excellent optical performance, much of which originates from the extreme thinness of plastic TAC substrates compared to glass.

They are:

- Conformable and shapeable
- High brightness and long lifetime
- Low-cost, Area-scalable, and Enables bezel-less displays
- Ultra-high contrast dual cell displays and Activating surfaces

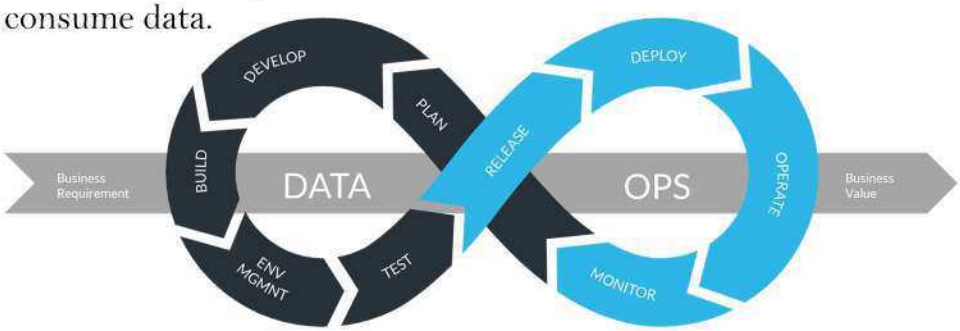
DATAOPS - WHEN AGILE MEETS DATA ANALYTICS

MS. PINKY YADAV (DI, CSE)

The amount of data enterprise businesses are producing is growing by 40-60% a year. Companies are facing challenges in managing, analyzing, and interpreting data so that they can enable solutions, support their data-focused teams, and glean valuable business insights. With requirements changing every day and the need for data access continues to grow.

What Is DataOps?

DataOps is an agile operations methodology that improves a company's use of data through better tools, automation, and collaboration. The primary purpose is to align data management tools, processes with data goals, improve communication and integration between data managers and the end-users who consume data.



In a nutshell, it borrows the principles of DevOps – an approach to more agile and collaborative software development to speed up build lifecycles and applies those principles and processes to data analytics.

It encourages improvement and innovation by introducing the concepts of agile development in data analytics, so data teams and the users who work with data can collaborate to create a hassle-free data pipeline.

Deploying it improves the speed and accuracy of data analytics across a company including data quality, access to data, automation, integration, development and deployment of data products and applications.

DataOps practitioners from different departments engage with teams of data scientists, analysts, engineers, and developers to create cross-functional collaboration

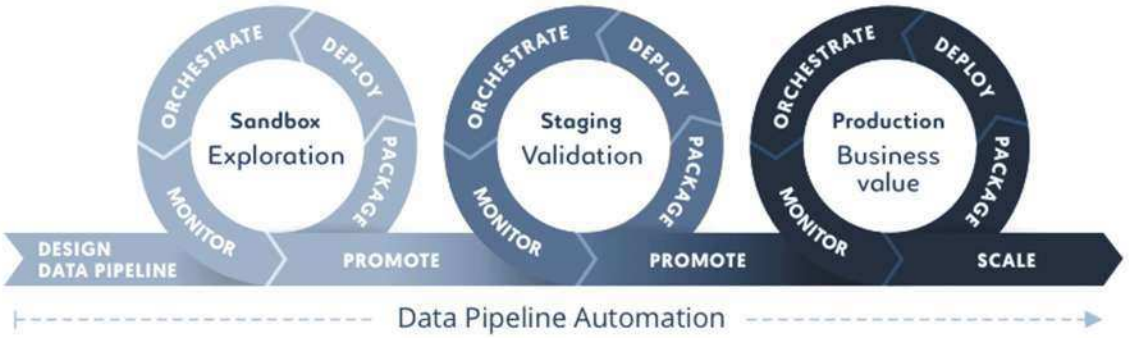
The Biggest Benefits of DataOps

DataOps methodologies lead to cleaner data, which results in improved analysis and business insights.

Improving collaboration between different parts of the technical team i.e engineers and data scientists to help companies access and leverage data efficiently.

It makes data more manageable and accessible for its biggest users who may or may not be as technically savvy as engineers.

Creation and management of central repositories for application data and data models allow for a more detailed layer of analytics for organizations.



The DataOps process

DataOps Helps Leaders Deliver Data Insights Faster and Better

Effective deployment of DataOps provides stakeholders the data they need, when they need it, in a way that works for them.

As companies ease into democratizing their data and giving users more self-service ways to get data without needing to involve IT or engineering teams, I predict that numerous companies will deploy DataOps methodologies to keep things running smoothly and optimize their data analytics processes as much as possible.

BIG DATA ANALYTICS, AN EMERGING TREND AMONGST STUDENTS

MS. SHIPRA VARSHNEY
ASSISTANT PROFESSOR, CSE

Big Data Analytics (BDA) is the latest thing in the IT market that is gaining a lot of traction. Most organizations are using it to improve their processes.

BDA is a contemporary branch of Data Science. In the modern global data environment, the collection and importance of data have increased exponentially over the past 10 years. This data has evolved into a variety of sources and types (Big Data). BDA involves the process of collection, storage, and processing of complex datasets to uncover hidden patterns, unknown correlations, and other useful information. Such intelligence can provide competitive advantages over rival organizations and result in business benefits, such as more effective marketing and increased revenue. BDA techniques such as sentiment analysis are now being commonly applied to social media data to gauge public and consumer response to events like product launches, political policy decisions, and customer service performance to name but a few.

Spending on Big Data technologies and Analytics is growing at 30 percent per annum as demand for data analytics skills continues to outstrip supply. In a survey carried out by SAP, three-quarters of firms report a lack of staff or graduates with data science skills. The finding from the survey of 300 businesses found that six out of ten companies last year had problems hiring personnel they needed for data analytics. Additionally, 84% of companies would like specific training to integrate analytics into their day-to-day work, as most businesses (92%) said that they had seen the amount of data grow in their organizations over the last 12 months.

Since 2013, more and more companies have moved into this field to exploit the huge volumes of data being captured by their IT systems. From banking and financial services to retail and health care and life sciences, the opportunities in big data analytics are expanding dramatically. The growth in BDA has also fuelled the growth in demand for Artificial Intelligence (AI) and Machine Learning expertise. When companies talk about looking for AI experts they often mean they are looking for Big Data experts.

ARTIFICIAL NERVOUS SYSTEM SENSES LIGHT AND LEARNS TO CATCH LIKE HUMANS

MS. VAISHALI
(ASSISTANT PROFESSOR, CSE)

MS. RUCHI PARASHAR
(ASSISTANT PROFESSOR, CSE)

MS. YAMINI RATAWAL
(ASSISTANT PROFESSOR, CSE)

A simple artificial nervous system can mimic the way humans respond to light and learn to perform basic tasks. The principle could be used to create useful robots and prostheses.

Humans, when confronted by external stimuli such as heat or light, can react rapidly and automatically. Think about how your hand withdraws from a hot surface, or how your leg flicks up when tapped on the knee.

These are unconscious responses. But conscious responses, such as catching a ball, must be honed by repeated stimulation.

Three university researchers from South Korea developed an artificial system capable of simulating a conscious response to external stimuli.

It consists of a photodiode that converts light into an electrical signal, a transistor acting as a mechanical synapse, an artificial neuron circuit, which acts as the system's brain, and a robotic hand.

When the photodiode detects light, it sends an electrical signal through the transistor that the light is on. That signal is carried to the artificial neuron circuit. There, the message is received, and that circuit then learns how to respond to the signal, sending a command to a robotic hand it controls. At the same time as the light is turned on, starting the whole process off at the photodiode, a ball is dropped from above the hand.

The process is similar to the way our eye transmits electrical signals via synapses to our brain, which then translates those signals, decides on a course of action, and sends a command to muscles to move – all within a fraction of a second.

In the early stages of the experiment, the brain of the system was slow to translate the light signal into a decision to cup the hand. The system isn't the first to try to mimic the biological response humans have to external stimuli. A paper in 2018 detailed attempts to recreate sensory neurons within the skin, while a 2019 paper focused on the development of artificial synapses. One of the authors of that paper even used an artificial nervous system to control cockroach limb movement. One of the goals of this research is to help people with neurological conditions.

BUSINESS INTELLIGENCE

-MS. SHIVANGI (ASSISTANT PROFESSOR, CSE)

Busines Intelligence(BI)comprises the strategies and technologies used by enterprises for the data analysis of business information. BI technologies provide historical, current, and predictive views of business operations. Common functions include reporting, online analytical processing, analytics, data, text & process mining, complex event processing, busines performance management, benchmarking, predictive and prescriptive analytics.

BI technologies can handle large amounts of structured and sometimes unstructured data to help identify, develop, and otherwise create new strategic business opportunities.

They aim to allow for the easy interpretation of these big data. Identifying new opportunities and implementing an effective strategy based on insights can provide businesses with a competitive market advantage and long-term stability.

BI is most effective when it combines data derived from the market in which a company operates (external data) with data from company sources internal to the business such as financial and operations data (internal data).

When combined, external and internal data can provide a complete picture which, in effect, creates an "intelligence" that cannot be derived from any singular set of data. BI applications use data from a Data Warehouse (DW) or from a data mart, and concepts of BI and DW combine as "BI/DW" or as "BIDW".

A data warehouse contains a copy of analytical data facilitating decision support. Business operations can generate a very large amount of information In the form of emails, notes from call centers, news, chats, reports, web pages, marketing material, and Image & video files. According to Merrill Lynch, more than 85% of all business data exists in these forms; a company might only use such a document a single time.

Because of the way it is produced and stored, this information is either unstructured or semi-structured. The management of semi-structured data is an unsolved problem in the information technology industry. BI uses both structured and unstructured data. The former is easy to search, and the latter contains a large quantity of the information needed for analysis and decision-making.

EDGE COMPUTING

MR. BIJENDRA TYAGI
ASSISTANT PROFESSOR, CSE

Edge computing is transforming the way data is being handled, processed, and delivered from millions of devices around the world. It can be defined as "a part of a distributed computing topology in which information processing is located close to the edge – where things and people produce or consume that information."

At its basic level, edge computing brings comput--ation and data storage closer to the devices where it's being gathered, rather than relying on a central

thousands of miles away. This is done so that data, especially real-time data, does not suffer latency issues that can affect an application's performance.

In addition, companies can save money by having the processing done locally, reducing the amount of data that needs to be processed in a centralized or cloud-based location.

While a single device producing data can transmit it across a network quite easily, problems arise when the number of devices transmitting data at the same time grows. Not only will quality suffer due to latency, but the costs in bandwidth can be tremendous. Edge-computing hardware and services help solve this problem by being a local source of processing and storage for many of these systems

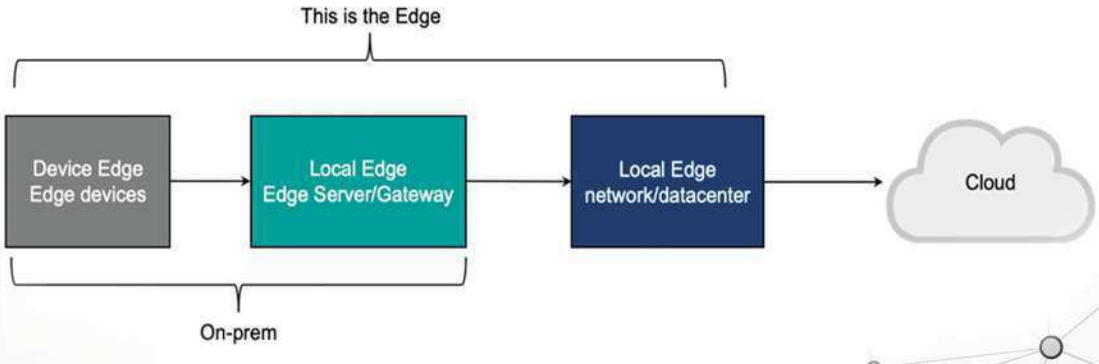
EDGE COMPUTING EXAMPLES

Enterprise edge computing examples

Manufacturing: reducing the amount of data going to the cloud for applications such as predictive maintenance and eventually moving operational technology to generic edge compute platforms to run processes in a cloud-like way, but still maintaining the reliability of an on-premise deployment

Retail: using edge computing to reduce latency to be able to create a rich, interactive experience in stores or at home (e.g. using augmented reality for online shopping)

Gaming: both hard-core multiplayer gaming and the growing area of cloud gaming would benefit from the edge by reducing lag for the end-gamer



BEYOND CLOUD COMPUTING::
"EVERYTHING-AS-A-SERVICE (XAAS)"

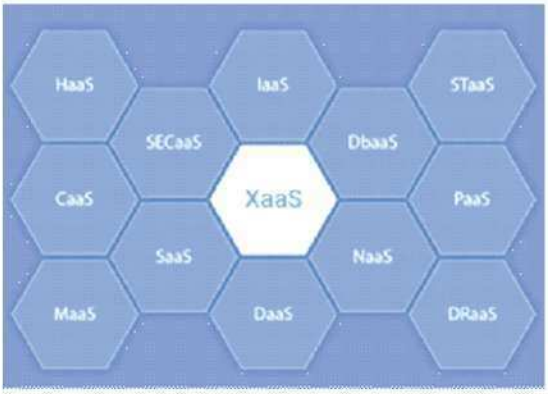
-MS. MEGHA GUPTA (ASSISTANT PROFESSOR, CSE)

Everything-as-a-Service (XaaS) is a cloud computing term for the extensive variety of services and applications emerging for users to access on-demand over the Internet as opposed to being utilized via on-premises means.

It gives you the flexibility to customize your computing environments to craft the experiences desired, all on-demand. XaaS has expanded to incorporate many services such as:

Function-as-a-Service
IT-as-a-Service
Infrastructure-as-a-Service
Security-as-a-Service
Database-as-a-Service

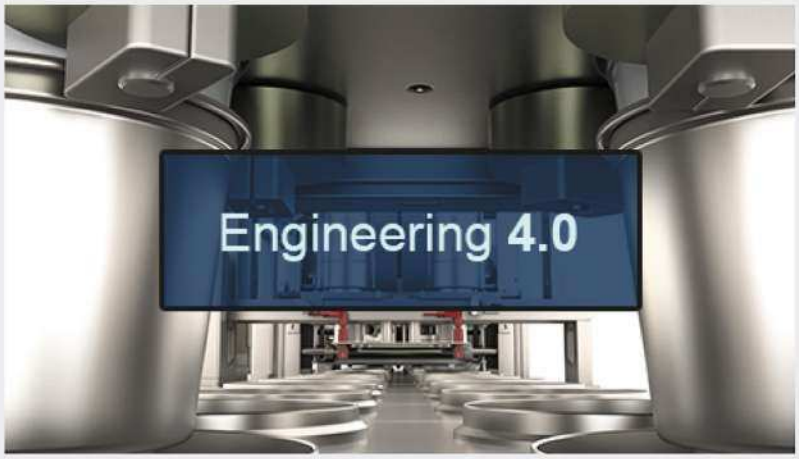
As these applications become more portable, compute cycles are easier to procure in real-time, data integration platforms streamline connectivity, and vendors form cross-platform alliances, that multi-cloud trend might start looking more like an Omni-cloud one in the near future. Companies investing in XaaS: HPC, RedHat, VMWare, AWS, Google Cloud, Microsoft Azure.



Student Articles

ENGINEER 4.0

ANSHITA CHUG, CSE, F2



Continuously developing skills and capabilities to meet future demands is one of the huge challenges that modern industry faces. It is to gain the required knowledge to drive and thrive in the digital revolution, also called Industry 4.0.

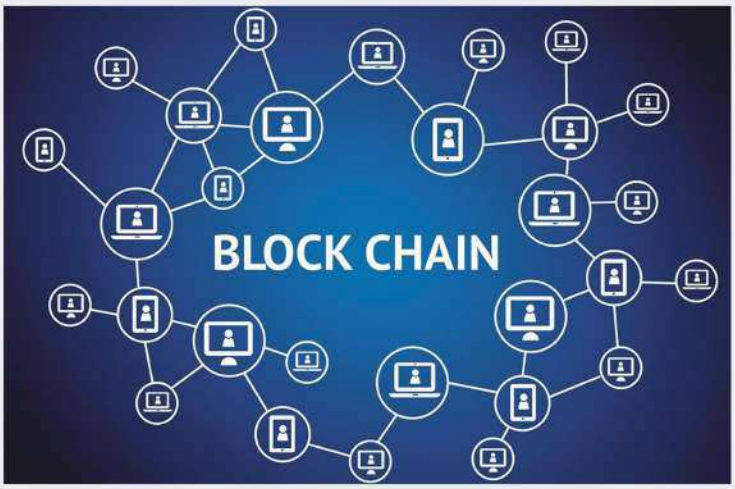
IT-based technologies have brought changes to the manufacturing industry immensely. To stay in the competition, companies have to increase their employees' expertise in digitization and smart production. To fulfill this new demand, universities and colleges provide training to their students on relevant latest technologies, recognizing the need to address industries.

The latest technologies can be like cyber systems, human-robot collaboration, modelling, simulation, Big Data Analytics, etc.

THE BLOCKCHAIN PARADIGM OF CRYPTOCURRENCY

TANMAY AJMERA, CSE, T2

Evolution, a word so influential that its presence over anything grabbed quite some attention over the centuries from homo sapiens to technology. Everything that is evolved is generally expected to be something better and considered revolutionary amid ages. Evolution of the barter system from money to cryptocurrency has been quite a thing to fancy. Cryptocurrency has been in the news lately and for a fact, it set new records for jaw-droppers.



Cryptocurrency is a virtual or digital asset that works as a medium of exchange like money. It is secured by cryptography so that the data is read by only those, to whom it has been transmitted which makes it nearly impossible to counterfeit. Many of the likes are Bitcoin, Ethereum, Ripple, etc.

Blockchain is a specific type of database that is decentralized and a more secure way to transact crypto. For security purposes, blockchain technology is used, as it is decentralized meaning the respected data is verified and maintained by a lot of people giving less chance for indecent approach. A more technical face is that it is a digital ledger that stores transaction details. These records are stored in containers called blocks. These blocks are linked to each other and are secured using cryptography. Hence the name Blochain.

BLOCKCHAIN HAS 3 MAJOR FEATURES THAT MAKE IT SPECIAL

A. Public Distributed Ledger – It is a collection of digital data which is shared, synchronized, and replicated across the world.

B. Encryption – Every block of data is secured from alterations/unauthorized access using cryptography.

C. Proof of work – The people working in the public distributed blockchain technology like bitcoin itself need to showcase their proof of work to all other people in the network around the world.

HOW ELECTRONICALLY SMART TATTOOS CAN REMOTELY CONTROL YOU AND YOUR PHONE

PRATEEK GUPTA, CSE, F 2

A group of Ph.D. students from the MIT Media Lab and researchers from Microsoft has recently come up with the ultimate wearable tattoo that can turn into a touchpad, remotely control your smartphone, or share data using NFC.

Inspired by the Flash Tat trend around beautiful temporary tattoos, our research has sought to expand this concept further into the wearables space by augmenting it with sensing and actuation functionality.

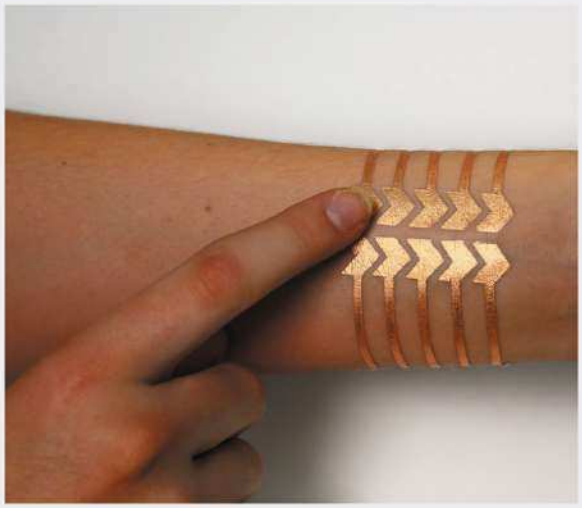
WHAT'S SPECIAL ABOUT E-TATTOOS?

1. As healthcare technology gets smaller and smarter, wearables e tattoos could minimize how essential medical devices interfere with a patient's life.

2. Medical tattoos can monitor important biomarkers such as heart rate, blood pressure, hydration, or blood sugar levels.

3. Eventually, these tattoos could be less invasive than traditional methods, while also being just as accurate and reliable as current devices.

WHAT MATERIAL THESE TATTOOS ARE MADE OF?



An e tattoo can be made of flexible electronic components such as conductive ink that can track important information about the person wearing it. According to Carnegie Mellon University, these tattoos are made using a liquid metal alloy to print ultrathin circuits.

The Medical Futurist explained that digital tattoos can be made of materials such as gold nanorods, graphene, or various polymers with a rubber backing.

MACHINE LEARNING - THE ULTIMATE TOOL FROM MANKIND

MEENU AHALAWAT, CSE, T17

As one of the most fascinating classes of computer science, Machine learning has rightfully captivated this imagination of the professionals and the masses alike. In the words of Nick Bostrom, a philosopher at the University of Oxford, “Machine intelligence is the last invention that humanity will ever need to make.”

So, what does Machine Learning really mean? By definition, Machine learning provides computers with the ability to learn without being explicitly programmed. Meaning, the machines can be made intelligent by learning just like humans. For example, learning is the acquisition of knowledge or skills through experience, study, or by being taught. Children, who learn by observing, listening, exploring, experimenting, and asking questions, are the best example of How Machine learning works.

Likewise, programmers teach computers by compiling algorithms and modeling problems. The computers are then trained and tested using data processing that allows the machines to explicitly predict the output for unique as well as evolving commonalities.

BIG DATA

VINAYAK TEWARI, CSE, S2

The term big data has been in use since the 1990s, with some giving credit to John Mashey for popularizing the term. Big data is a field that treats ways to analyze, systematically extract information from, or otherwise, deal with data sets that are too large or complex to be dealt with by traditional data-processing application software. Therefore, big data often includes data with sizes that exceed the capacity of traditional software to process within an acceptable time and value.

THE CHARACTERISTICS OF BIG DATA ARE

Volume: The quantity of generated and stored data. The size of data determines the value and potential insight, and whether it can be considered big data or not.

Variety: The type and nature of data.

Velocity: The speed at which the data is generated and processed to meet the demands and challenges that lie in the path of growth and development.

Veracity: The truthfulness and reliability of data, which refer to data quality and data value.

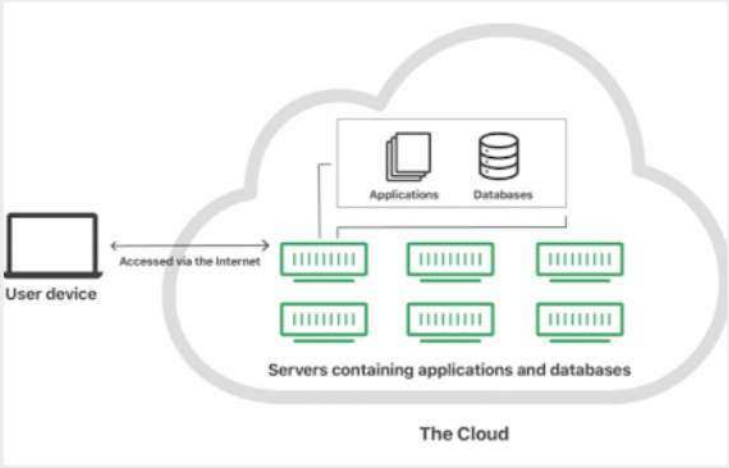
Other characteristics include Exhaustive, Fine-grained, and Uniquely Lexical, Relational, Extensional, Scalability.

CLOUD AND THE NEED FOR CLOUD SECURITY

ASHI SAXENA - CSE T17

WHAT IS THE CLOUD?

"The cloud" refers to servers that are accessed over the Internet, and the software and databases that run on those servers. Cloud servers are located in data centers all over the world. By using cloud computing, users and companies don't have to manage physical servers themselves or run software applications on their machines."



MAJOR CLOUD SERVICE PROVIDERS

AWS - Launched by Amazon in 2006. It provides 175 products & services in 190 countries and has 1M active customers.

Azure - Launched by Microsoft in 2010. It provides 169 services in 57 regions and has 300k customers.

GCP - Launched by Google in 2010. It provides over 90 services.

WHAT IS THE NECESSITY FOR CLOUD SECURITY?

As multifarious organizations move quickly to digitally transform their operations, effective security controls are often an afterthought. Often, businesses refrain from proven best practices and make it difficult, if not impossible to accurately assess and manage the risk. As businesses adapt to ongoing change and move aggressively to the cloud - Necessary policies, controls, and technologies to protect data, applications, and infrastructure services need to be implemented.

SOME BEST PRACTICES FOR CLOUD SECURITY ARE :

Know who is responsible for each aspect of cloud security, rather than assuming that the cloud provider will handle everything.

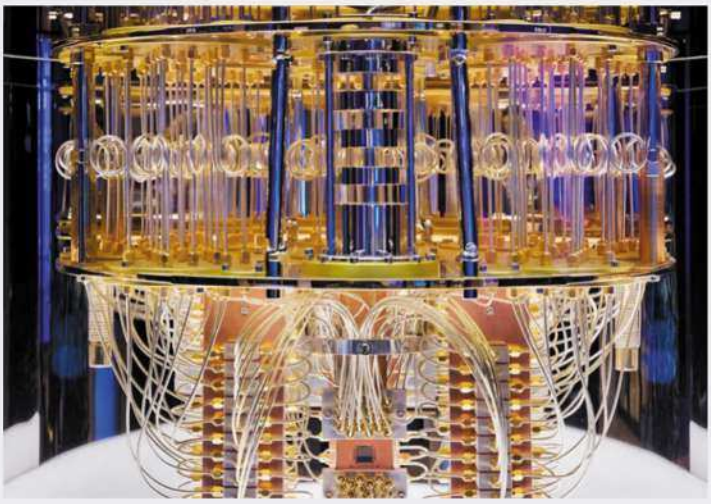
Understand how cloud architecture works to help avoid security holes due to misconfiguration.

Disable unused ports and remove unnecessary processes and instances, since all of these can contribute to vulnerabilities.

QUANTUM COMPUTERS

ACHAL JAIN - CSE T17

Are quantum computers going to break encryption and reveal all our secrets? Do they allow for massive parallel computation and will dwarf supercomputers? These types of questions are getting increased attention. It is on the agenda of the board of multinational companies and governmental bodies. Some see it as THE solution to all our problems while others fear it will be our demise.



HOW DO THEY WORK AND WHAT CAN WE EXPECT FROM THEM?

The development of quantum theory, which started at the beginning of the 20th century, has been an enabler for much of the technology we now take for granted. Devices such as LED, silicon chips, and solid-state drives (SSDs), to name a few, are based on the principles of quantum mechanics.

WHAT MAKES A QUANTUM COMPUTER "QUANTUM"?

The most important difference between a classical and a quantum computer is the fundamental unit of information - the "bit". Whereas a classical bit can be in only one of two states (0 or 1), a "qubit" (quantum bit) can be in both states at the same time. This is called the principle of superposition and is one of the most fundamental concepts in quantum theory.

HOW DO QUANTUM COMPUTERS LEVERAGE QUANTUM PROPERTIES TO PERFORM COMPUTATIONS?

Quantum calculations work in a fundamentally different way and also have different components. The first step in a quantum calculation is to prepare the input as a superposition of all possible states, rather than select a specific initial state. In reality, a quantum computer leverages entanglement between qubits and the probabilities associated with superpositions to carry out a series of operations (a quantum algorithm) such that certain probabilities are enhanced (i.e., those of the right answers) and others depressed, even to zero (i.e., those of the wrong answers).

Quantum computers represent a paradigm shift in computation. We are entering a fascinating period in the development of quantum computers. Quantum systems are scaling up in both size and reliability and are getting close to showing a real advantage over classical computers. As this technology is still in such an early phase, it may be that it's true impact is not even fully understood yet. This makes this field even more fascinating to follow.

VIRTUAL REALITY

TEJASWINI CSE S1

When a person uses electronic devices such as special goggles with screens or gloves fitted with sensors, they can interact with a computer-generated simulation of a three-dimensional environment i.e. Virtual Reality (VR). It is a simulated experience that can be similar to or entirely different from reality.

The user can have a realistic-feeling experience in this simulated artificial environment.
Through the use of technology, VR creates an immersive artificial world that can appear to be quite real.
A virtual reality viewer allows users to look up, down, or any other direction, as if they were there in person.
Virtual reality has a wide range of applications, from entertainment and gaming to sales, education, and training.

Two types of VR exist- immersive VR and text-based networked VR (also known as "Cyberspace"). When you tilt your head, the immersive VR changes your view. While both VRs are suitable for training, distance learning is best conducted in cyberspace. Sometimes, these two types are even mutually supportive of one another's efforts.

The standard virtual reality systems currently on the market use either virtual reality headsets or multi-projected environments to generate realistic images, sounds, and other sensations that simulate the user's physical presence in a virtual environment. VR allows a person to look around an artificial world, walk around in it, and interact with virtual objects. As well as VR headsets, specially designed rooms with large screens can also produce the same effect, as long as they have a head-mounted display with a small screen in front of the eyes.
Gaming, 3D cinema, and social virtual worlds are the most common applications for VR. Video game companies released the first consumer virtual reality headsets in the early-mid 1990s.
In addition to sporting events, 3D cinema has also been used for fine art, music videos, and short films. To match visual effects with haptic feedback, roller coasters and theme parks have been using virtual reality since 2015.

GPT-3

PIYUSH BHARDWAJ CSE S1

i.e. Virtual Reality (VR). It is a simulated experience that can be similar to or entirely different from reality.

AI is a vast topic that consists of numerous bizarre content. One of them is GPT-3, the upcoming language model.

The meaning of Technology keeps changing from time to time.
It is the way we apply scientific knowledge for practical purposes. It includes machines (like computers) but also techniques and processes (like the way we produce computer chips).

Developments, in historic times such as the telephone, printing press have lessened physical barriers for communication and allowed humans to interact freely on a global scale. Similarly, In today's era, AI (Artificial intelligence) is the most interesting and curious topic among technologists.

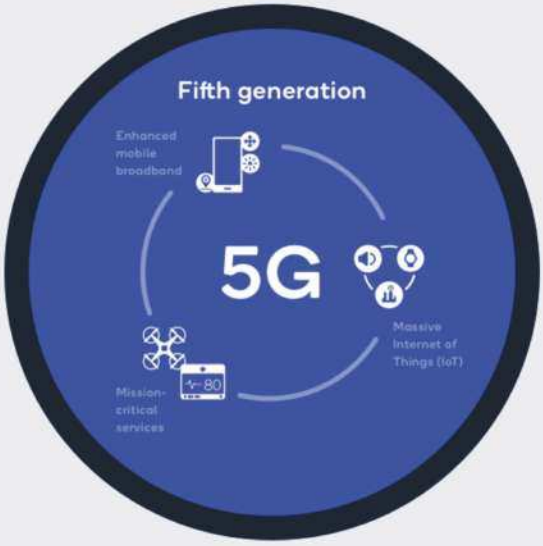
When a person uses electronic devices such as special goggles with screens or gloves fitted with sensors, they can interact with a computer-generated simulation of a three-dimensional environment

GPT-3 is also known as Generative Pre-trained transformer 3 which is an autoregressive language model that uses deep learning to produce human-like text. It is created by open AI and is the third generation “state of art language model”. Before the release of GPT-3, the largest language model was Microsoft’s turning NLG. GPT-3’s capacity is 10 times larger than that of NLG because GPT-3 can "generate news articles which human evaluators have difficulty distinguishing from articles written by humans,". The GPT-3 has some potentially harmful effects that include misinformation, spam, phishing, and many more. A tool like GPT-3 can cause many jobs to become obsolete inclusive of journalists, writers, and scriptwriters, to name a few. However, the impact is much more extended than that. The ability to generate code directly from specifications could make software engineers, at least as we know them now, reductant as well.
GPT-3 is capable of performing zero-shot, few-shot, and one-shot learning.

5G AND ENHANCED CONNECTIVITY

PRIYANKA KUMARI- CSE S17

5G is the next generation of wireless network technology, designed to expand the scope of mobile technology beyond the capabilities of LTE. It will be transformative, fueling innovation across every industry and every aspect of our lives. Over time, 5G technology will change the way we live, work, and play for good.



HOW DOES 5G WORK?

5G networks can be built in different ways from multiple bands of wavelength spectrum: low-band, mid-band, and high-band.

High-band millimeter wave frequencies have greater bandwidth available to carry more data in dense urban areas but require cell sites to be in close proximity and have limited penetration in buildings. Mid-band balances speed and range, providing broader coverage than high-band. And it’s less impacted by buildings. Low-b band, like our powerful 600MHz spectrum, travels farther than other bands—over hundreds of square miles—and can pass through more obstacles, providing better coverage and a stronger signal both indoors and out.

WHAT ARE THE BENEFITS OF 5G?

Verizon has the engineering experience and partnerships to move huge amounts of data at significantly faster speeds than before.

Millimeter wave spectrum and deploying a massive fiber network, we've been able to introduce .In a 5G-powered tomorrow, entire supply chains can be fundamentally reshaped. With its gigabit speeds and unprecedented response times, 5G Ultra Wideband can be thought of as the “secret sauce” that can make connected cars, cloud-connected traffic control and other applications that depend on essentially instantaneous response and data analysis live up to their potential.

In a nutshell, 5G and other advanced, high-speed networks allow all of the other trends we've discussed to be accessed anywhere, at any time.
Complex machine learning applications that require real-time access to Big Data sources can be automated and run in the field.

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