KESHAV MAHAVIDYALAYA

NAAC Accredited 'A' Grade

UNIVERSITY OF DELHI

"Only Knowledge can provide salvation"

e-BLITZINE 2022

DEPARTMENT OF COMPUTER SCIENCE

ISSUE 6

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From the Principal's Desk

The whole purpose of education is to convert mirrors into windows.
- Sydney J. Harris

With great pride, I am delighted to share that the Department of Computer Science brings yet another edition of its e-Magazine, the e-Blitzine 2021-22. In more than 25 years of existence, Keshav Mahavidyalaya has been on a remarkable higher education journey, opening windows for its students to a rapidly changing world with tremendous advancement in technology. The past two years of pandemic have forced us to adapt to technology in all spheres of life whether it be education, health, hospitality, banking, finance etc. The Department of Computer Science has always urged its students to focus on their strengths and comprehend the world with its technological trends in a more profound way.

"Don't let what you cannot do interfere with what you can do." said John Wooden.

Sustaining imagination and inspiring innovation are two critical components of fruitful training and e-Blitzine is an ideal platform where the innovative energies of our students and the substance of their roused creative mind are used in the most splendid manner. The magazine is an assortment of such creativity and talents of our students.

The 6th Issue of 'e-Blitzine' is being successfully launched as a result of the dedicated teamwork of the entire editorial board comprising of both faculty and students from the Department. I congratulate all the contributors for presenting the Department activities and for expressing their thoughts via numerous articles on recent trends in Artificial Intelligence. I also appreciate every student who joyfully participated in co-curricular and extracurricular activities along with their academic commitments. I wish our students the very best in their lives and pray that success follows all their endeavours.

Prof. Madhu Pruthi
Principal
Keshav Mahavidyalaya

From the Vice Principal's Desk

"The computer was born to solve problems that did not exist before."
-Bill Gates

The above statement by the great philanthropist is a proven fact seen and adapted by each and every individual in the pandemic era. Advancement in digital technology helped us to cope up with the unforeseen situation created by the deadly disease. In fact, the teaching learning process through online tools has been a boon to the academic world. Needless to say that all our students and faculty worked very hard to face this challenge. e-Blitzine , a product by our brilliant intelligent technology zealots is a platform to share their knowledge in the digital world. Students showcase their talent in the form of various types of articles through this medium. This increases their writing and editing skills as well. I congratulate the students and staff of computer science department for coming up with yet another issue of the magazine. My sincere thanks to our Principal, Prof. Madhu Pruthi for her constant support in this endeavour. All my best wishes to the editorial team for the successful launch of the e-magazine.

Prof. Priti Sehgal
Vice Principal
Keshav Mahavidyalaya

From the Convenor's Desk (e-Blitzine)

Dear Readers,

On behalf of the Department of Computer Science, Keshav Mahavidyalaya, It gives me immense pleasure and a great sense of privilege to present to all of you, the 6th edition of our annual magazine, e-Blitzine, 2021-22. The aim of the magazine is to remind the success of yesterday, to appreciate the endeavours of today and to encourage the creative minds of tomorrow.
The theme of 2022's edition is **AI Empowering the Future**, a very hot topic among the students of today.

"Artificial intelligence is one of the most profound things humanity has ever worked on. It is more profound than fire or electricity."

- Sundar Pichai
CEO, GOOGLE

Today, AI is influencing the future of mankind in every field. It is the main driving force behind most of the research done in all existing and emerging technologies like Robotics, IoT, Blockchain, MetaVerse, Cloud Computing, Big Data etc. The magazine includes numerous articles depicting the impact of Artificial Intelligence in our daily lives as well as how AI would control the future of the world.
With more profound content and more insights into the latest innovations in technology, you will find this issue interesting as well as fun to read.
I am proud of my editorial team, both teachers and students for their dedication and hard work in bringing out this issue of e-Blitzine. I thank and applaud all the contributors who spared their time and effort to share their thoughts and knowledge via articles, poems, artwork etc. to make this magazine possible in its current form. I hope you enjoy reading the magazine and assure you that the Department would continue to work harder taking the legacy forward.
My sincere thanks to our Principal Prof. Madhu Pruthi and all members of teaching and non teaching staff of the Department for their full support in this endeavour.

Dr. Roli Bansal
Associate Professor
Department of Computer Science

From the Convener's Desk (BLITZ)

BLITZ (Brilliant Information Technology Zealots), the Student Society of Department of Computer Society strives to bridge the gap between academia and industry by engaging students with the right expertise for emerging themes in Computer Science.

Throughout its history, the Society maintained its esteemed status through tireless efforts of many of its present and past Convenors, Teachers, and Students. This year also, the journey embarked on this ever changing world wouldn't be possible without a highly motivated team of teachers and students, who are Dr. Sumit Agarwal - Faculty, Mr. Sudhir Kumar- Faculty, Ms. Jyoti Kumari - Faculty and Mr. Farhan Akhtar - President, Ms. Simrat Deol - Secretary, Ms. Somya Gupta - Treasurer, Mr. Gaurav Hira - Executive, Tushti Adlakha - Executive, Udit Kaushish - Executive, Ms. Smrati Sharma - Executive, Mr. Agam Gupta - Executive, Ms. Diksha Singh - Executive, Ms. Harshita Mahajan - Executive, Ms. Shruti Sharma – Executive.

This year also, BLITZ Society organized a plethora of Webinars on various topics of students' interest. Cyber Security, Learning Competitive Coding, Data science and Data Analytics using Tableau were few among the topics on which knowledge is dispersed among learners. Industry professionals (Internationals and National) as well as academicians joined with us, interacted with our students. Moreover, the preparations for the Annual BLITZ festival, comprising events which challenge young minds, are underway with great enthusiasm and surely will add feather in the cap of the team. Journey that we have embarked on this ever changing world wouldn't be possible without research, its findings and its proper documentation.

I am sure, the society will continue its mission in offering a platform to learn soft skills, and gain insight of recent advancement in the industry/academia through their experts. I would like to acknowledge the backing of Prof. Madhu Pruthi, the Principal of the college, for her relentless encouragement and utmost support in this endeavour. But of course, the most important roles belong to the students of today and tomorrow to keep this society growing and flourishing, for there is no society without you.

Dr. Bhavna Gupta
Associate Professor
Department of Computer Science

From the Teacher In-Charge

I sense great pride that the editorial board of the Department has put together the next issue of e-Blitzine for the academic year 2021-22. The magazine mirrors the enthusiasm, knowledge and creativity of the students. I congratulate the convener, the committee members and the student editorial board on having successfully brought out the magazine. I am sure the readers will find this edition very intriguing, enlightening and resourceful. I wish all the students the very best in their future endeavors.

At the end, in line with the focus of this issue, I would like to quote:

“Artificial Intelligence is the new electricity.”
- Andrew Ng

Enjoy Reading !!

Ms. Maulein Pathak
Teacher in Charge
Department of Computer Science

ABOUT BLITZ

Brilliant Information Technology Zealots, a society formed by the first batch of B.Sc (Hons.) Computer Science with a feeling to promote innovative thinking and professional growth, has turned out to be a "power-house" for the whole college. It has largely contributed in making Keshav Mahavidyalaya to be "the happening place in the DU fraternity". The vision conceived by the founders of the society was to enable higher academic standards and enhance the quality of extracurricular activities in the college. Under the guidance of our Principal, faculty members, and fellow mates we have turned BLITZ, from just being another society in the college to making it a thinking, acting and an ever changing entity. We at BLITZ believe and live by the motto 'SILICON MINDS, CIRCUITED HEARTS' and in the endeavor, organize events such as seminars, debates and technical festivals to keep the students abreast of new advances in the fast changing world of information technology.

ABOUT e-BLITZINE

The 6th Edition of e-Blitzine Magazine has been designed with the zeal to provide the readers with the best of content and trivia in the world of Computer Science. Made with a lot of care by the best minds of our Computer Department, this magazine aims to bring the readers all the information and facts about the latest advances in the field of Artificial Intelligence and its subsets in different domains. Through interesting articles, bright images, dramatic poems, engaging crosswords, e-Blitzine ensures that the readers are at the top of their game and we hope that this magazine will be a good experience for you.

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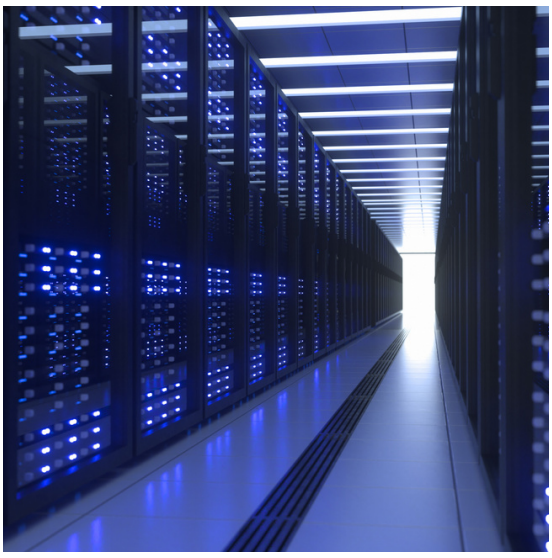

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BLITZ EVENTS

BLITZ, The Computer Science Society of Keshav Mahavidyalaya and It's annual magazine, e-Blitzine brings to you its annual report for the year 2021-22.
During the course of the year, The society organises several events to reflect the latest trends going on in the Digital world. These events help the students gain essential knowledge for their career and studies. The events this year included Coding competition, Webinars and the Blitzkrieg-2022.

Even though the Global Pandemic had stopped our daily, regular lives, the Team and the participants did not stop in their quest to receive more knowledge and we received a tremendous response from the students of the Department and all events were organised with a lot of enthusiasm and energy. The events were organised as a single day event, and we had several eminent speakers. Webinars on "Cloud Computing", "Data Science" and "Cyber Security" were organized along with a Coding competition on HackerRank. With this, we hope you will continue supporting us as we shall bring even more events to you in the future.

CYBER SECURITY

Event: Trends in Cyber Security

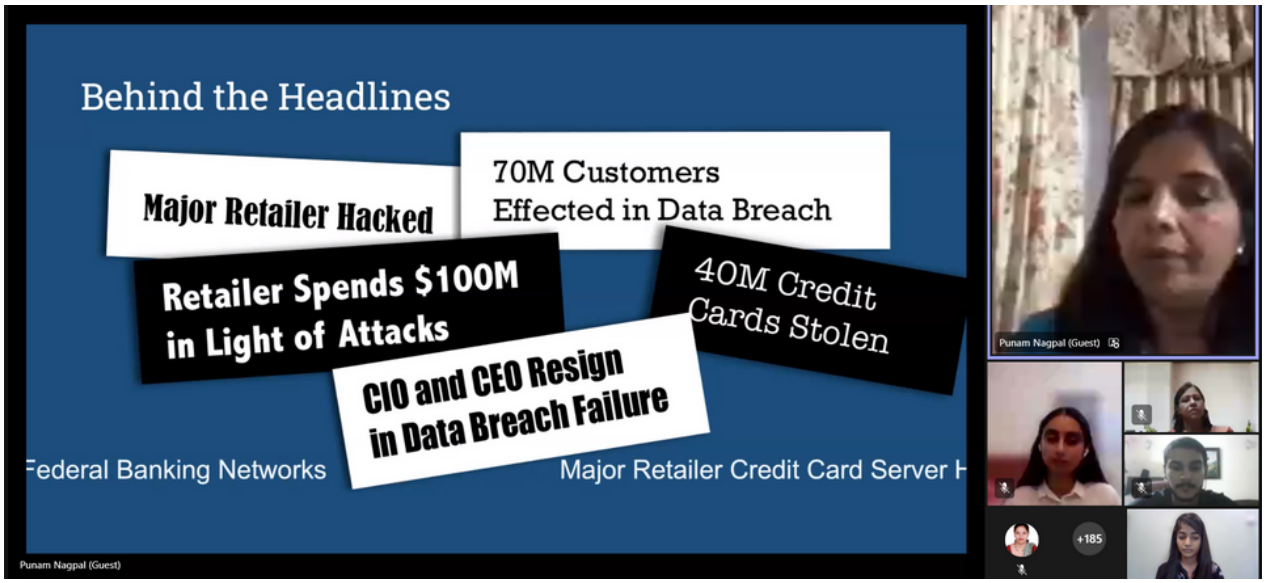
Date: 13th September 2021

Speaker: Ms. Punam Nagpal, Product Manager, Security Business Group, Cisco

Description: BLITZ, the Computer Science society of the Keshav Mahavidyalaya, organized a webinar on the trends in Cyber Security on 13th September 2021. The speaker of the event was Ms. Punam Nagpal.
The webinar started with a warm welcome of the speaker by Prof. Madhu Pruthi, our venerable Principal, which was followed by the words of gratitude from Prof. Priti Sehgal, our Vice-Principal.

The session started with a brief introduction of Cyber Security and its importance by the speaker, followed by an account of her experiences in Cisco. The real-life accounts of cases of different frauds and other cases related to Cyber Security kept the session practical and informative. As it is said; the best teacher is experience, and that is what we gained from the speaker's own accounts of how to deal with such situations optimally. "Prevention is better than cure," keeping this in mind, following the scenarios, she gave various ways in which we can be careful and avoid these scams beforehand. The tips included paying attention to the sender's email and not sharing information to suspicious emails, forbid sharing extra information on social media, keeping passwords complex and keeping extra email addresses for non-professional work.

General but necessary topics like ransomware, threats against critical infrastructure and cyberbullying were also taken up at the session. As the session concluded the speaker indulged the participants in an interactive discussion in the form of a FAQ session where she generously satisfied the queries of various participants on cybersecurity. The webinar ended with a vote of thanks by the President of the BLITZ Society.



"Learn from the mistakes of others... you can't live long enough to make them all yourselves!!"

DATA SCIENCE OVERVIEW

Event: Data Science overview

Date: 9th October 2021

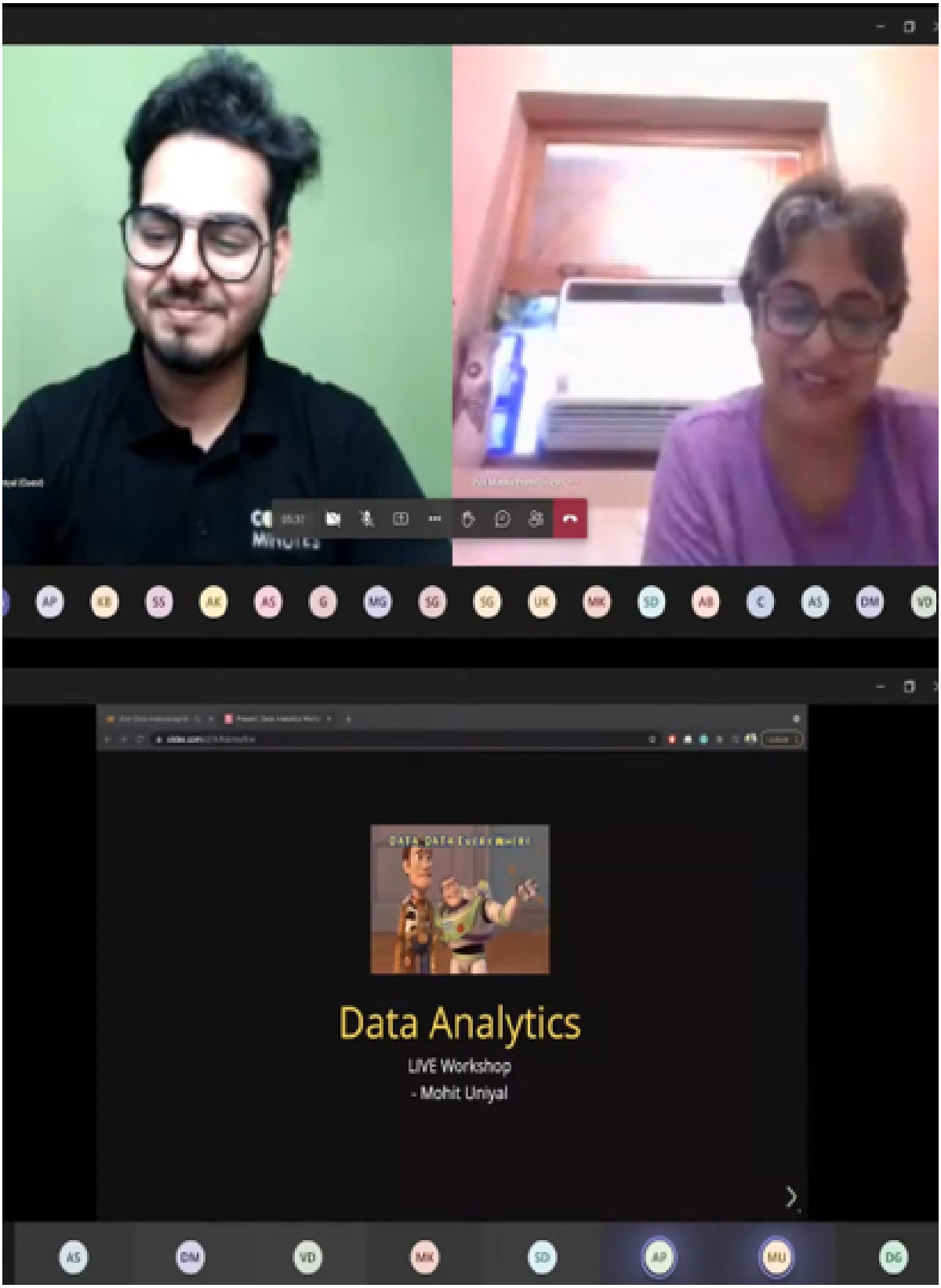
Speaker: Mr. Mohit Uniyal, Instructor and Product Engineer, CodingBlocks
Google code-in mentor for Tensorflow organization

Description:

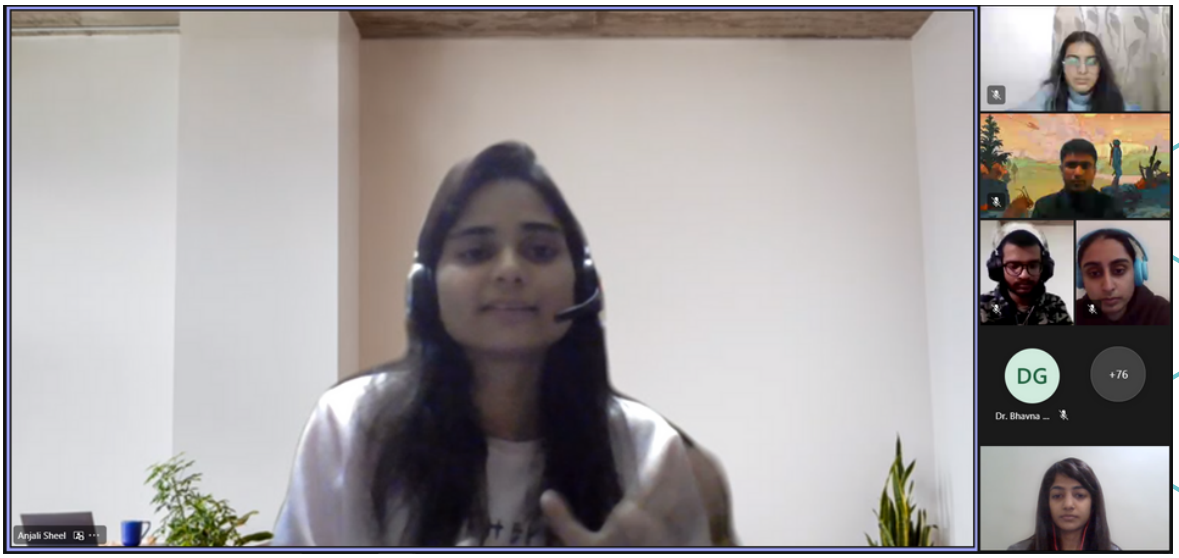
Data Science is a multidisciplinary field that utilizes scientific inference and mathematical algorithms to extricate important insights from a lot of structured and unstructured data. These algorithms are actualized by means of computer programs which are generally run on amazing hardware since it requires a lot of processing. Since it is an emerging field whether you want be a Data Scientist or a Data Analytic, the society organised a webinar with Mr. Mohit Uniyal as it's speaker. Mr. Uniyal started the session by giving an introduction on the new trends in data science, and how python is emerging as one of the top languages for the field. After giving a short intro about Google Collaboratory, an online python based system, that works on cloud, he started the session by giving a problem statement to the audience. Throughout the session he kept on giving such problem statements which made the session so knowledgeable and interesting. Towards the end he answered various questions of the audience.

"To find the data that's hidden, and to make use of that data, are two very different things"

At the end of the session, he came up with an interactive quiz to check the knowledge of the students about what he taught. The quiz was a fun experience and it helped revise and sum up the session neatly with even the teacher's competing in good sport. This important detail was no doubt fun, as was evident from the enthusiasm we received.



COMPETITIVE CODING WEBINAR



Event: Competitive Coding

Date: 24th December 2021

Speaker: Ms. Anjali Sheel, SDE2 at Microsoft, Ex - SDE at Siemens Healthineers, Educator at unacademy, Mentor at Engage, Codementor, and scaler academy

Description: BLITZ, the Computer Science society of Keshav Mahavidyalya organized a webinar on Competition Coding. The speaker for the session was Ms. Anjali Sheel. The webinar started with a warm welcome of the speaker, the organizers, and students and a brief introduction of the speaker, Ms. Anjali Sheel, a little dig into all her achievements at a young age. The speaker started the session with a brief journey of her student life. She advised students to be regular and to never stop learning. She introduced the importance of competitive coding in the life of a Computer Science student. Students were given information about platforms like HackerRank and CodeChef, which are very helpful. Then, she discussed the process of effectively creating a resume. Few of the important bits empathised and elaborated upon were: “adding your skills on the left side”, “making your resume infographic”, “avoiding creativity and addition of tables”.

Following resume building, what came next was the interview. She described her experience of interviews which were followed by some tips. “Confidence is the key”, “You are not bound to answer every question”, “Don’t use the bookish definition for any topic,'' were some of the effective ways stated by the speaker that can help one in interviews.

Towards the end of the webinar, she answered eager questions of the attendees. The webinar was overall very informative, interesting, and knowledgeable. As the webinar was regarding competitive coding and the road map to big tech, it was very beneficial for the freshers and 2nd-year students.

Dr. Bhavna Gupta, the convenor of BLITZ, thanked Ms. Anjali Sheel and all the participants for attending the webinar. We look forward to more such sessions to help students get better insights and inculcate necessary skills to thrive.

CODING COMPETITION

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Event: Coding competition
Date: 22th January, 2022
Platform: HackerRank

Description: BLITZ, the Computer Science society of Keshav Mahavidyalaya organised a Coding Competition on hackerank.com. The competition started at 11 AM sharp. One hour and thirty minutes was the time duration for the competition. Each participant was given five questions whose difficulty levels ranged from easy to hard; two questions were easy, two were medium and one was difficult. The results were based on the accuracy of the code and the time taken. The participants with the most accurate codes and least time taken were chosen as winners.

A total of 30 Students participated in the competition.
The winners of the competition were

1. Prashant Kumar Mishra, 1st Year

2. Lipika Gupta, 2nd Year

3. Abhishek Yadav, 1st Year

The competition was overall very successful. We look forward to more of such coding competitions.

DATA ANALYTICS WITH TABLEAU AND EXCEL

Event: Data Analytics With Tableau And Excel

Date: 29th January, 2022

Speaker: Dr. Monika Arora
Associate Professor,
Apeejay School of Management, New Delhi

Description: BLITZ, the Computer Science society of Keshav Mahavidyalaya organised a webinar on Data Analytics With Tableau And Excel on 29th January, 2022. The speaker of the event was Dr. Monika Arora.

Dr. Bhavana Gupta, the convener of BLITZ society warmly welcomed the speaker, teachers and all the participants to the event.

The speaker initiated the session by tossing a question among the participants. The question was "Do we use data analytics in our daily life?" which led to a long discussion on data analysis in our day to day life.

Moving further with the event, the speaker elucidated various data visualization methods like graphs, charts, and maps. The topic was made more interesting when she explained all type of charts and graphs with the advantages and disadvantages of each of them. She, then, introduced tableau and excel to participants.

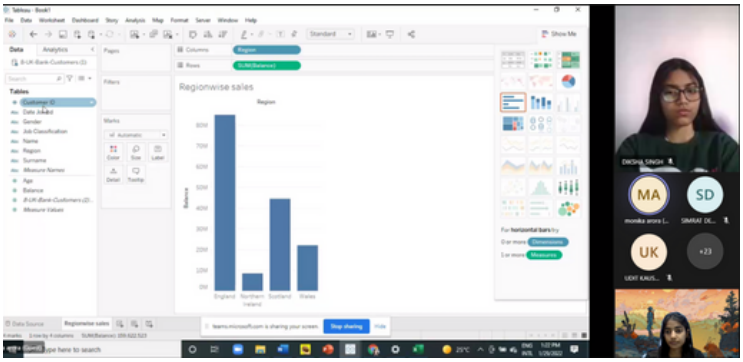
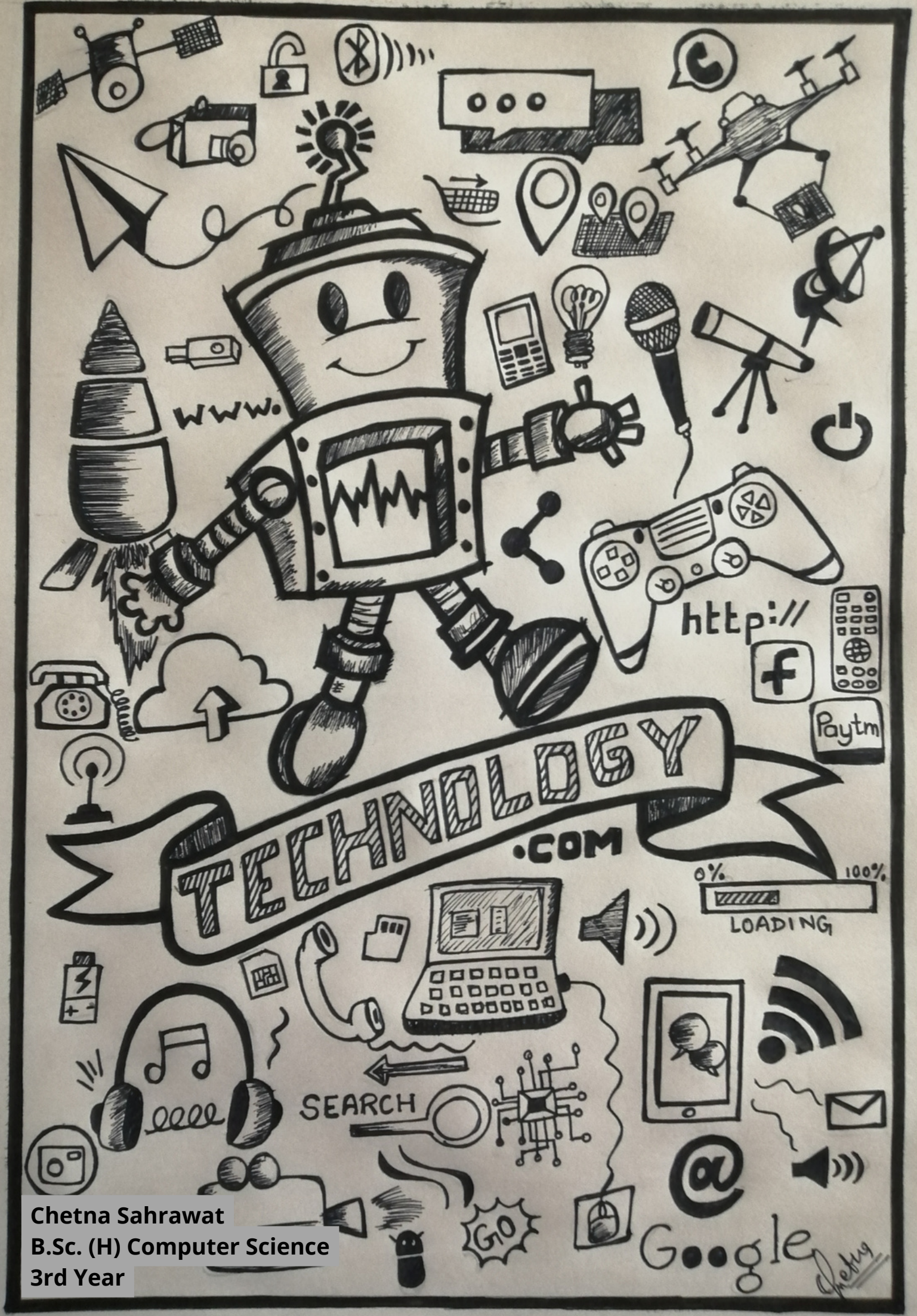


Tableau was a new platform for all the students, therefore, she described it in detail which led to a conclusion that tableau is a better application to manage data than usually used Excel.

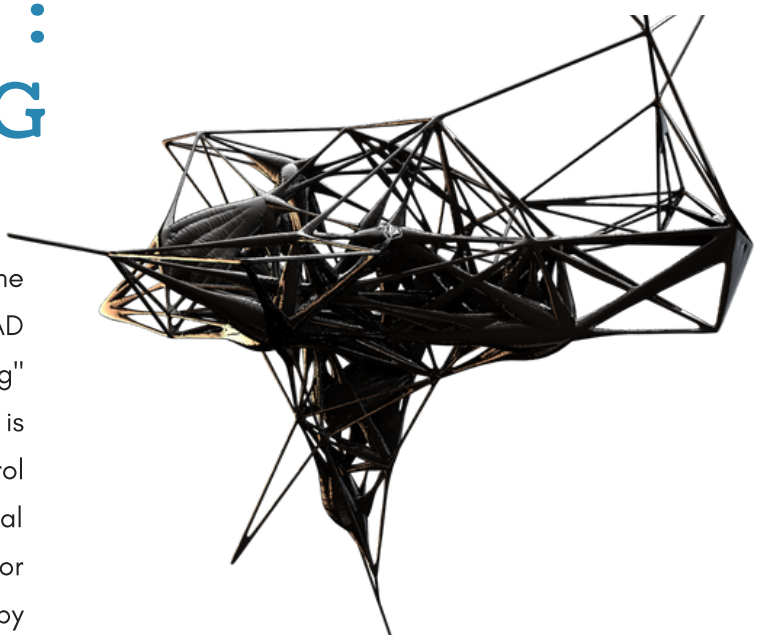
As the session came to a close, the speaker took up an interactive discussion as a FAQ session where she indulged the queries of various participants on data analytics. The webinar concluded with a vote of thanks by Bhavana ma'am.

The webinar was a big success. It was very interactive, informative and helpful. We look forward to even more events that help students learn about new platforms which may help them in future.



Chetna Sahrawat
B.Sc. (H) Computer Science
3rd Year

3D PRINTING : AN EMERGING TECHNOLOGY



3DPrinting, or Additive Manufacturing, allows the construction of a three-dimensional object from a CAD model or a digital 3D model. The term "3D printing" can refer to a variety of processes in which material is deposited, joined, or solidified under computer control to create a 3 Dimensional object, with the material being added together (such as plastics, liquids, or powder grains being fused together), typically layer by layer.

3D printing has been in use in the Food Industry, Fashion Industry, Health Sector, Transportation Industry, and many more.

" With 3D printing, complexity is free. The printer doesn't care if it makes the most rudimentary shape or the most complex shape, and that is completely turning design and manufacturing on its head as we know it."

- Avi Reichental
(CEO of 3D Systems)

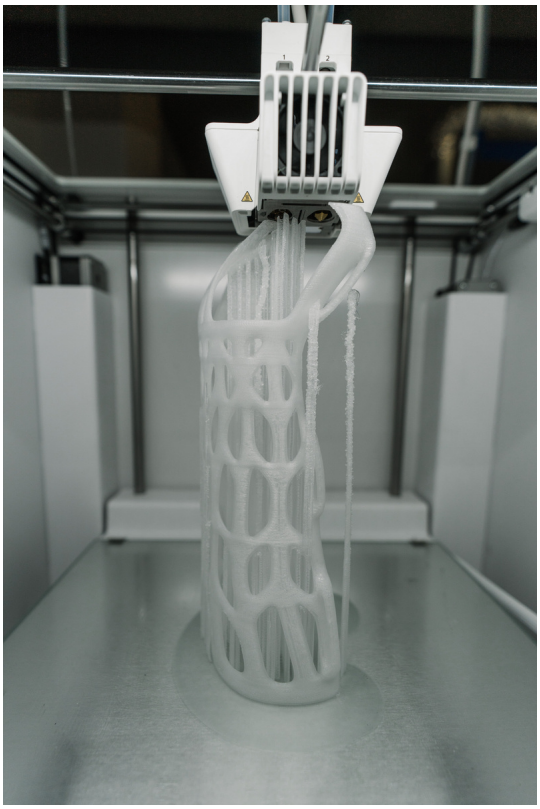
In the Food Industry, companies like Barilla, which is working on the manufacturing of pasta and chocolate, create unique shapes and textures by building layer by layer. Globally, we are facing rising populations with an imbalance in nutrition & wealth. And, according to reports published by Harvard Business School and other research bodies based on 3D technology, researchers are seeing this as a solution to solve all these problems and are cost-efficient as well. To achieve its maximum level there is the requirement of regular and holistic R&D in Additive Manufacturing (AM).

Additive Manufacturing (AM) came into use in the 2000s, inspired by the theme of material being added together (in any of colorful ways). In discrepancy, the term subtractive manufacturing appeared as a retronym for the large family of machining processes with material junking as their common process.

The term 3D printing still pertains only to the polymer technologies in utmost minds, and the term AM was more likely to be used in metalworking and end- use part product contextures than among polymer, inkjet, or stereolithography suckers. Inkjet was the least familiar technology indeed though it was constructed in 1950 and inadequately understood because of its complex nature. The foremost inkjets were used as reporters and not printers. As late as the 1970s the term archivist was associated with inkjet. Nonstop Inkjet later evolved to On - Demand or Drop-On-Demand Inkjet. Inkjets were single snoots at the launch; they may now have as numerous as thousands of snoots for printing in each pass over a face.

Some Pros of 3D printing are as :

- Flexible Design
- Strong and Lightweight part
- Rapid Prototyping
- Print on Demand
- First design and Production
- Minimum wastage
- Cost Effective and many other.



But, as all other human creation it also several cons:

- Limited Materials
- Restricted Build Size
- Post Processing
- Large Volume
- Design accuracies

and so on.

3D printing technology has lots of potential though which country can achieve more in less finance and for that there's an urgent need to form a trilateral cooperation between government bodies, institutes and companies. The trilateral cooperation will rapidly increase the development and uses of 3D printing.

Ayush Kumar Jha
B.Sc. (H) Computer Science
1st Year

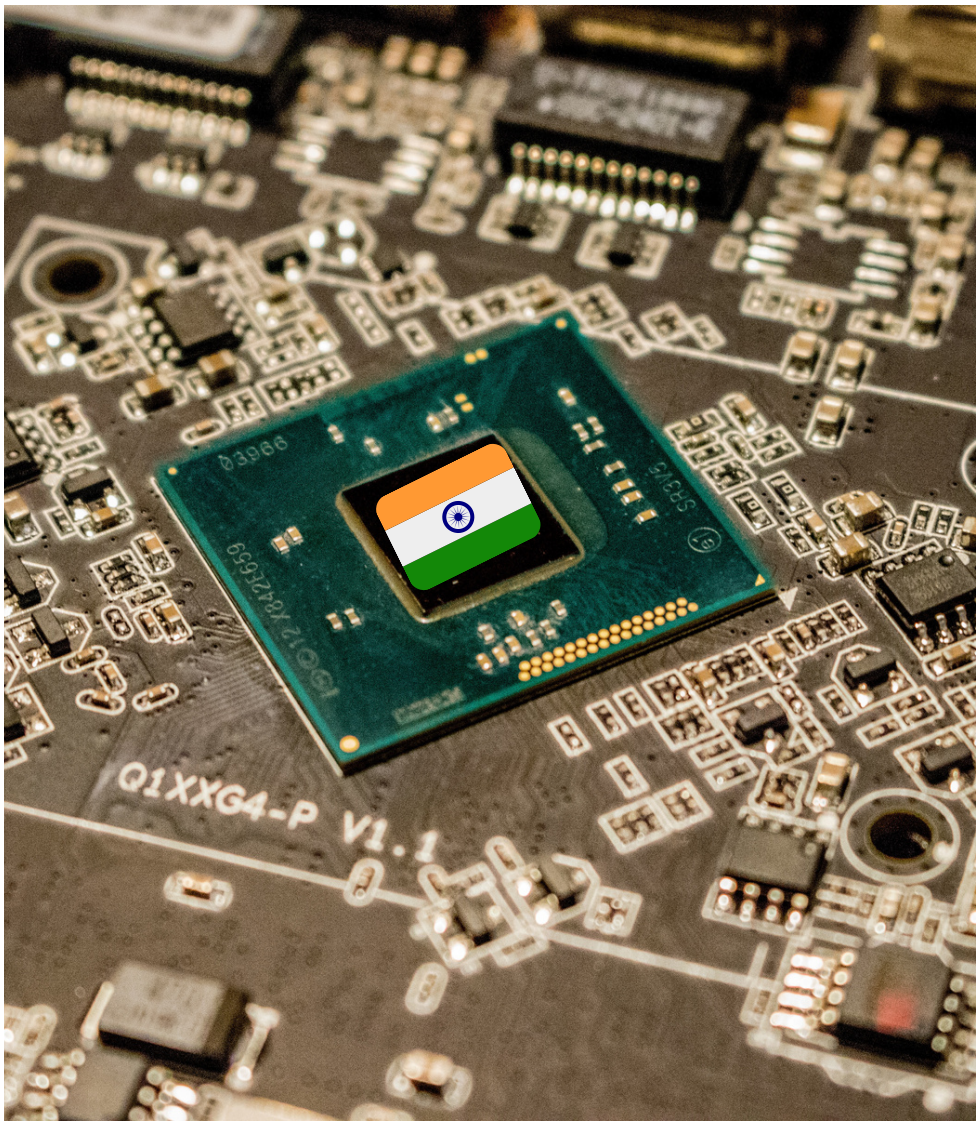
Vocal For Local: Fostering Semiconductor Industry in India

"Very happy that within such a short time frame, superb response has been received from the semiconductor industry participants":

Ashwini Vaishnav, Union Minister for Electronics and IT.

Digital services are the backbone of any country. Semiconductor chips play a vital role in the growth of these services since they are heavily used in electronic devices. Packed with a million of transistors in a size less than a 1nm, a semiconductor enables from a mobile phone to computer system, coffee shop to restaurant also not to mention new potential game changing applications such as Quantum Computing, Artificial Intelligence, Cloud Computing and IOT devices. Despite the slow growth rate of economy due to pandemic, a notable growth of digital services has been recorded during last two years as everyone started working from home.

The size of the global semiconductor industry is around 552.96 billion U.S. dollars till date.



It is expected to grow to $803.15 billion in 2028 with a Compound Annual Growth Rate (CAGR) of 8.6% in next 7 years (2021-28) as per data provided by Semiconductor Association. CAGR measures how much a company or industry is capable of generating return on investment during a given interval of time. Due to the increase in digital services across the globe, every country is trying to take a slice of the pie in the semiconductor market. In the line of this, the govt of India has launched Rs. 76000 Cr Production Linked Incentive Scheme (PLI) and portal for India Semiconductor Mission (ISM) to foster the semiconductor industry. This scheme also competes with China's semiconductor manufacturing policy and also promotes the 'Make in India' mission.

ECOSYSTEM OF SEMICONDUCTOR INDUSTRY

There are five major categories of the semiconductor industry. These are mainly Integrated device manufacture (IDMs), fabless, foundry, semiconductor equipment suppliers and OSAT. A company which designs, manufactures and sells its own branded chips is called IDM. These companies have in-house design facilities and fabrication plants where chips are manufactured. Intel corporation, Samsung electronics and NXP semiconductor, Texas Instruments (TI) are examples of IDMs. With time, the complexity of chips has increased so companies started focusing on design and fabrication separately. The segregation of designing and fabrication is called foundry model. In 1980, when smaller chip makers were left with a surplus of products, the fabless chip model evolved in a hard-to-crack market.

Fabless develops semiconductors for use in many sorts of electronics items, such as digital cameras, smartphones, and the new technologically sophisticated "smart" vehicles. The well-known fabless companies are NVIDIA, Qualcomm, AMD, MediaTek etc. On the other end, a foundry company operates a semiconductor plant and manufactures chips for others but has no chip designing facility. To keep overall cost low, foundries have mainly located in those countries such as China and Taiwan where labour is cheap and plentiful. These are Taiwan Semiconductor Manufacturing Company (TSMC), Samsung, GlobalFoundries, China's Semiconductor Manufacturing International Corporation (SMIC) etc.

The next category of semiconductor industry is semiconductor equipment suppliers. They supply the equipment to fabless and foundry industries. The biggest players in this category are Lam Research, ASML etc. The OSAT companies are involved in packaging, testing and assembly of Silicon chips manufactured by foundries.

The Manufacturing Process

Semiconductor manufacturing is one of the most complex processes of the world. It requires hundreds of processes. It is not possible to discuss all the processes here but we can divide the entire process into eight steps. These are:

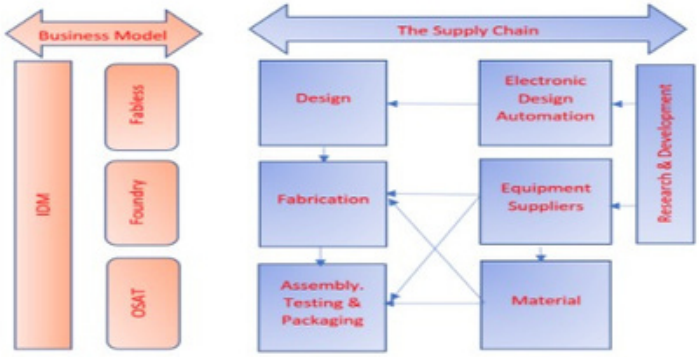
Note: 2021 figures are estimates; Source: companiesmarketcap.com.

Wafer Processing: Chips are manufactured from silicon which is extracted from sand. In the first stage, sand is heated more than 1000 degree Celsius to separate carbon monoxide and silicon. High graded pure silicon is melted to form cylinders called ingots. Now these ingots are sliced into pieces called raw wafers. These raw wafers are polished to make a smooth surface suitable for printing circuit patterns.

Oxidation: The oxidation process is used to form a protective layer on the wafer's surface using Silicon Dioxide. Silicon Dioxide (SiO_2) film can be formed by placing wafers in 800 to 1200 degree Celsius environments by flow of oxygen on the wafer surface. Silicon dioxide can also act as a mask against numerous contaminants, allowing impurities to be introduced into silicon only in areas where the oxide is not present.

There are two types of oxidation process: "dry oxidation" or "wet oxidation". Dry oxidation is carried out using high purity oxygen gas while wet oxidation uses steam for the oxidation process.

Photolithography: It is the process of printing circuit patterns on the wafer. It has mainly three steps: coat, expose and develop. In the first step photoresist material coating is applied on the wafer surface. In the next step, the wafer is exposed to the UV rays to print the desired pattern on it with the help of a lens. Finally, the wafer is immersed in a solvent. The photoresist material of the exposed part is washed away while the hard part remains on the wafer.



Etching: Chemical (wet) etching or Reactive Ion Etching (RIE) dry etching processes can be utilised to permanently imprint photographic patterns into the wafer. Wet etching uses certain chemicals such as potassium hydroxide (KOH) while corrosive gas (or ions) is used for dry etching. Photolithography and etching processes can be repeated several times.

Diffusion: The process of adding impurities into a semiconductor is called doping. Doping process helps to control flow of current in the transistor. Ionisation is also used to introduce impurities in semiconductors. After doping photoresist material has been removed and copper layer has been introduced.

Film Deposition: In order to build a multilayer semiconductor, we need to deposit a series of dielectric (insulating) and metal (conducting) layers followed by etching to form a three-dimensional structure.

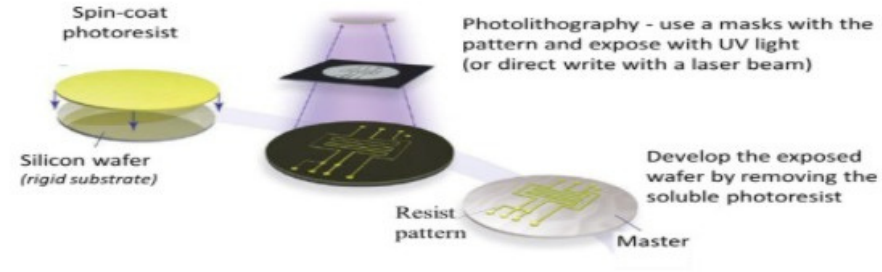
Interconnection: After several layer formation now wiring has been done among the transistors according to the design pattern of the chip.

Testing and packaging: Electronic Die Sorting (EDS) is a method of inspecting the electrical properties of each chip while it is still on the wafer and thereby increasing semiconductor yield. Now bad chips are removed using EDS testing and good chips are mounted in packages (headers).

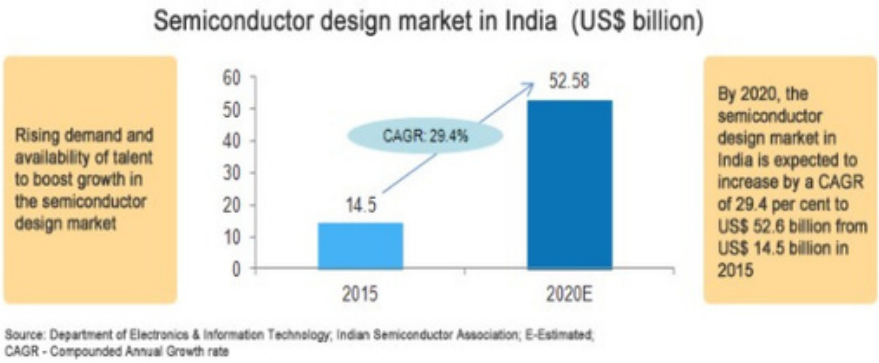
Who rules the world of semiconductors: Key Players?

The largest foundries, Taiwan's TSMC (TSM) and South Korea's Samsung Electronics, account for more than 60% of the semiconductor production market. TSMC is the leading manufacturer of chips with a diameter of 10 nanometres or less, while Samsung is the industry leader in memory chips.

Intel is the industry leader in desktop and laptop processors. Nvidia (NVDA), Qualcomm (QCOM), Broadcom (AVGO), and Advanced Micro Devices (AMD) are all well-known fabless chip design companies of the United States. Japan and South Korea companies are involved in the wafer manufacturing business



Photolithography Process: Coat, Expose and Develop



Source: Department of Electronics & Information Technology; Indian Semiconductor Association; E-Estimated; CAGR - Compounded Annual Growth rate

Where India stands?

The Indian semiconductor industry is growing at a 30% CAGR and is expected to cross 92 US Billion Dollars as per data available with the Department of Electronics and Information Technology, Government of India. Chip consumption has grown by 61.44% and crossed US$ 8.25 billion in the last two years. More than 20,000 working professionals and 2,000 chip design capacity every year, India emerged as a global hotspot. The key factors behind strong demand are penetration of internet services, strong demands for consumer durables, automation, use of IOT devices in industrialisation and upcoming 5G technology.

The aim of the PLI scheme is to develop a semiconductor manufacturing ecosystem by enabling financial and technological support for design, fabrication, assembly, validation and testing. The government targets to set up one-two fab units for display and ten units for design and manufacturing components.

Vedanta group has already signed an agreement with FOXCONN to manufacture semiconductor in India. Foxconn, a Taiwanese conglomerate, is the first major foreign tech company to respond to India's push to bring chip manufacturing onshore..

The Tata group is also talking with Tamil Nadu government to set up a plant with a investment of $300 million for assembly and testing. The Tata plant will rely on the wafer manufacturing by offshore foundries.The other well known companies are Tata Elxsi, Broadcom Inc, NXP semiconductors, Samsung Semiconductors, Sankalp Semiconductor – An HCL Technologies company, Micron Technology etc.

India can focus on assembly, testing, marketing and packaging (ATMP) of semiconductors because of its various strengths.

This phase of production is labour intensive and does not require huge investment.India can take advantage of strong strategic relationship with US and Japan to tie up with equipment and wafer production companies to become a preferred ATMP hub. Thus, India should aim to establish itself as a major player in the backend and gradually move up to build frontend capabilities over the time.

Mr. Pradeep Kumar
Assistant Professor
Department of Computer Science

AUTOMATED MACHINE LEARNING

The traces of Automated Machine Learning or **AutoML** stars from the time when the 1st neural networks came into existence. The next major step was the first major computer fully programmed to play checkers.

In 1956, a federation called FICO was founded , whose aim was to use data analytics to create a credit score system. This was achieved by 1958.By 1959, the term Machine Learning was introduced by Arthur Samuel. By 1967,there were programs which were capable of Pattern Recognition. By 1990s, some companies like unica introduced some models like Pattern Recognition Work Bench.

In mid and late 2020s, many models, as the research & development increased with time, like rapid modeler, feature selection, factory miner, came into existence. In the current scenario, many models with different work are in the market like Azure from Google.

WHAT IS AUTOML

AutoML or Automated Machine Learning, is a part of Artificial Intelligence (AI) , as its name suggests, it is the procedure to program our model in such a way that it can automatically perform a real world problem by use of machine learning. In simple words, we can describe it as the process of automating the time consuming, iterative tasks of Machine Learning Models. AutoML helps data scientists to develop a models with a large scale, high efficiency, great productivity, while ensuring sustainability.

It is a method to make machine learning available for non-machine learning units. Software platforms using AutoML makes ML user friendly and makes it accessible to individuals without having specialization in Data Science.

AUTOML OR ML: WHO HOLDS THE POWER ?

The making of a manually operated engine to do a specific work is known as Machine Learning whereas the term Automated Machine Learning refers to automating a model to perform a specific task without a manual instruction.

The advantage of AutoML over ML is that it saves time, saves computational power, makes work easier while working over complex problems

WORKING:

The process behind the runtime of a model starts from processing of data which with the help of diverse algorithm and algorithm selection depicts to get what the user wants to get done.

The steps include getting raw data from the user, followed by cleaning of the data. Next we proceed with selection of features after which the processing & construction of desired model is done.

After the model is initialized, the next step is of parameter optimization, after which the model is validated.

TRAINING PROCEDURE: CLASSIFICATION

It is a common machine learning process, in which model learns by using test data, then apply the learning on new data.

The main goal of classification model is to predict in which category the new data will fall into by the learning of test data.

Common examples - fraud detection, handwriting recognition, object detection.

REGRESSION:

It is similar to classification, as regression task is same as common supervised machine learning from test data.The difference of regression from classification is that the output in the classification is categorical data whereas in the regression process the output values are based on independent predictor variables in forms of continuous data. It establishes the relationship on basis of how independent variables impact other variables

WORKING OF THE MODEL AUTOML

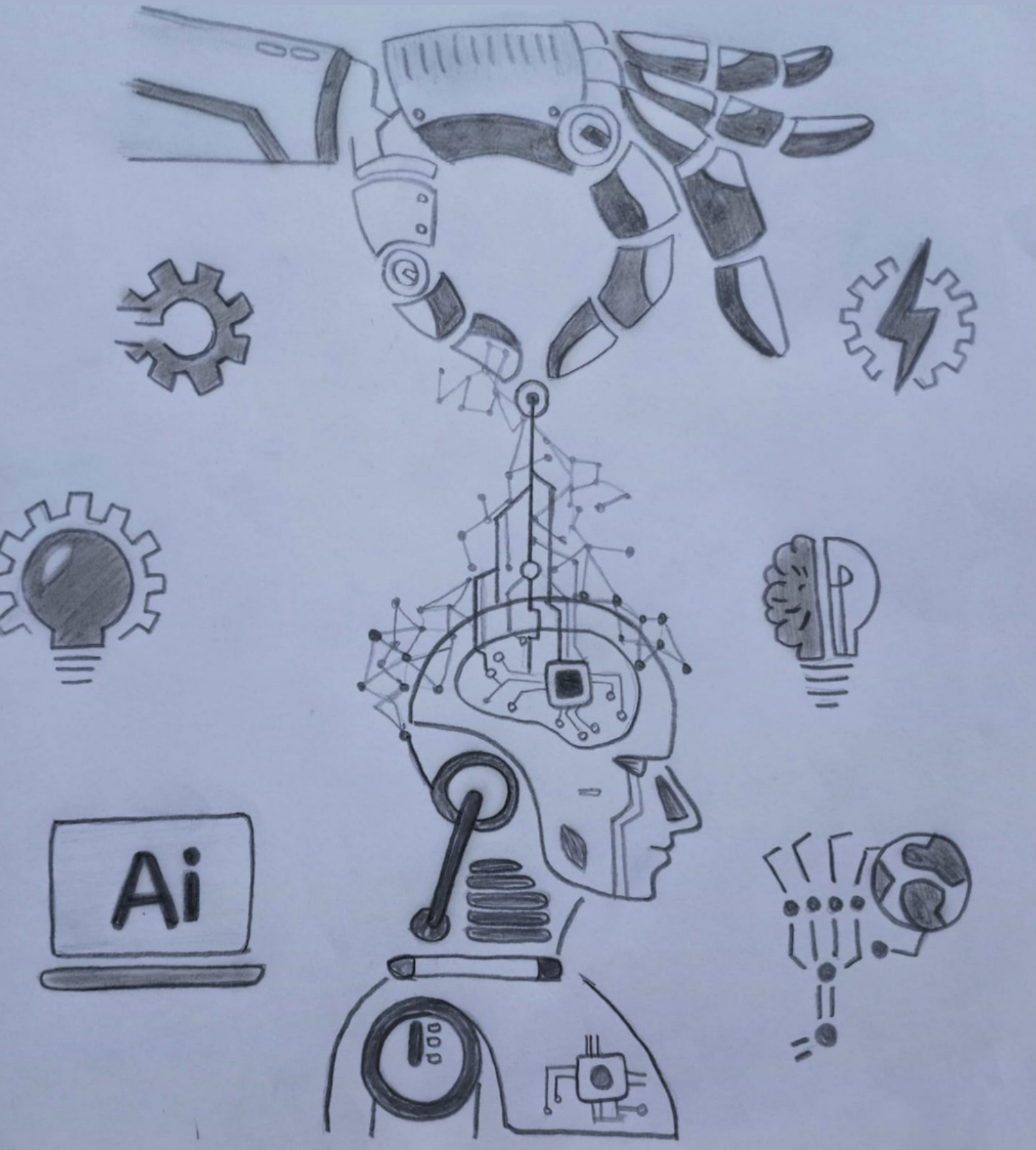
At the time of model training , vector pipelines and variable algorithms, on the basis of the feature selected, are created. Then the model tries to identify the problem it is required to solve on the basis of classification, regression and computer vision. This proceeds to the configuration of AutoML parameters .
After finalizing the parameters, on the basis of the data sheets, constraints, and the target, the model is generated by the user in training and the model automatically makes sets of different features, algorithms and parameters.

Now during testing from various sets of the algorithms, the model tests each set with various conditions including boundary conditions. After which it makes the table on how the set works in percentage. Then it ranks the different sets on the basis of efficiency and their productivity.
Finally, the best model is taken as the output program for further processing on the various real world situations.

Conclusion

In the present world, the scope of AutoML is very broad. We can see the use of AutoML everywhere. From traffic signals to MRI equipments, from social media to trading, AutoML is coming up in various sectors.
The work in the industries is proceeded with the help of AutoML by programming and making models to work with the industry.
In the future AutoML might replace humans in many industries like in manufacturing industry, the percentage of work by machinery is more than the percentage of work done by humans.

Prashant Kumar Mishra
B.Sc. (H) Computer Science
1st Year



Saloni Chauhan
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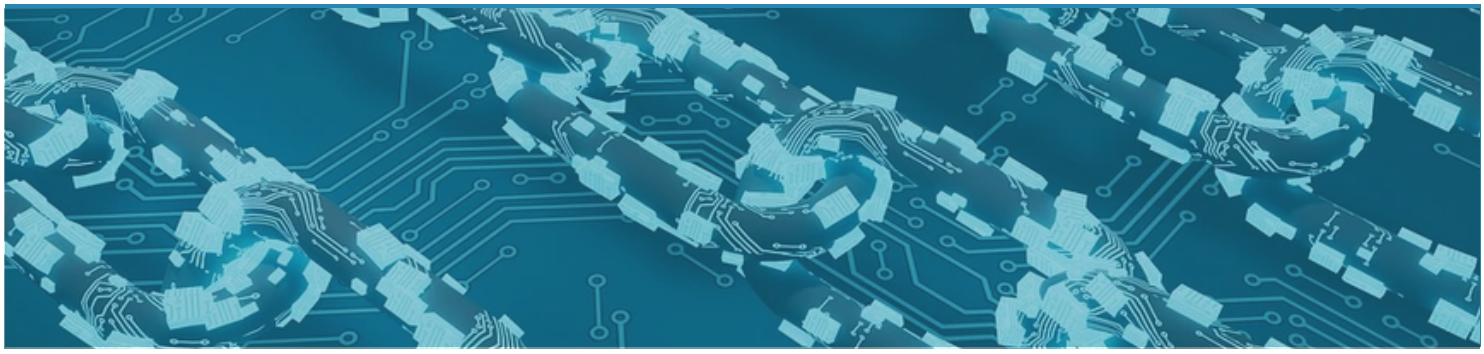

BLOCK-CHAIN TECHNOLOGY

If I ask you to list the top five companies, you will probably think of Google, Microsoft, IBM, Amazon, and others. But do you know that none of them are decentralized. What do I mean by decentralized? I mean they keep our data and sell it to get money, and the information is not shared with you. So, do you feel cheated that your data has been sold? Is there a solution? Well there is. Blockchain technology is here to change the way our data is stored. Now what is blockchain technology? Let's begin to understand.

Very simply put, blockchain is just a technology created by a program written by a programmer. So on the surface, they are just computer codes. But to understand what the code does, we will have to understand its functioning.

A chain of blocks that contains information is termed a blockchain and is a distributed ledger that is completely open to anyone. It seems you don't know what ledger means. A ledger is a book or other collection of financial accounts. So we can suppose blockchain as an open ledger where a piece of information is recorded after suitable authentication by a network of participants. Unlike the age-old ledger method, originally a book or database files stored in a single system, Blockchain Technology is designed to be decentralized and distributed over a large number of computers.

It is used to record and track different things from financial translation to medical records. You might have thought we already have computers and notebooks to track data, what is so special about blockchain? The reason why we should use Blockchain Technology is that the way it tracks and stores data is super safe.

There are several industries that blockchain is likely to disrupt such as banking and payments, cyber security, forecasting, networking and LOT, insurance, ridesharing apps, online data storage, charity, voting, government, public benefits, healthcare, and online music.

Let's understand with an example:

Let's suppose there was a dispute between Priya and his brother Ankit over who owns the piece of land that's been in the family for years. Because blockchain technology uses the ledger method, Adam first owns the property in 1900 as mentioned in the ledger showing that, and when Adam in 1930 sold it to Dave a new entry was made on the ledger and so on. Every change in ownership of this property is represented by a new entry in the ledger. Right up until Priya bought it from her father in 2007 and Priya is the current owner and we can see that history in the ledger. Since in blockchain no previous data can be erased or changed, we can only add a new block of information to the chain.

How does it work?

Each block has three components (a) Hash of previous block, (b) Hash (c) data Here Hash means some security codes, it is like your fingerprint which is always unique, therefore it makes super difficult to change any block, because if anyone tries to change the block than he has to change Hash of the block but this change will not be accepted by previous and after block, since they all are joined by the Hash.

So what can you do, after knowing this? You can first learn more about blockchain technology and share your knowledge with your near ones, so everyone could be aware of new upcoming technology.

Krishna Kumar
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OSINT technology with two heads: Dark & Soviet

We humans are social animals, and we love sharing information about ourselves, our likes and dislikes, what we do for a living, our favorite sports teams, etc. Billions of people sharing tons of data on hundreds of platforms, everything available publicly, which is completely harmless in the form of the mess it is present. But if collected and organized in one place, it becomes a threat. This data then can be used by threat actors against us or against anything that involves us.

This practice of collecting publicly available data is not new, in fact, it can be traced back to the 1980s when the military and intelligence services turned to freely available or even officially published sources to gather information and look for useful intelligence to facilitate their investigations. The term OSINT was coined to refer to this kind of spy-craft.

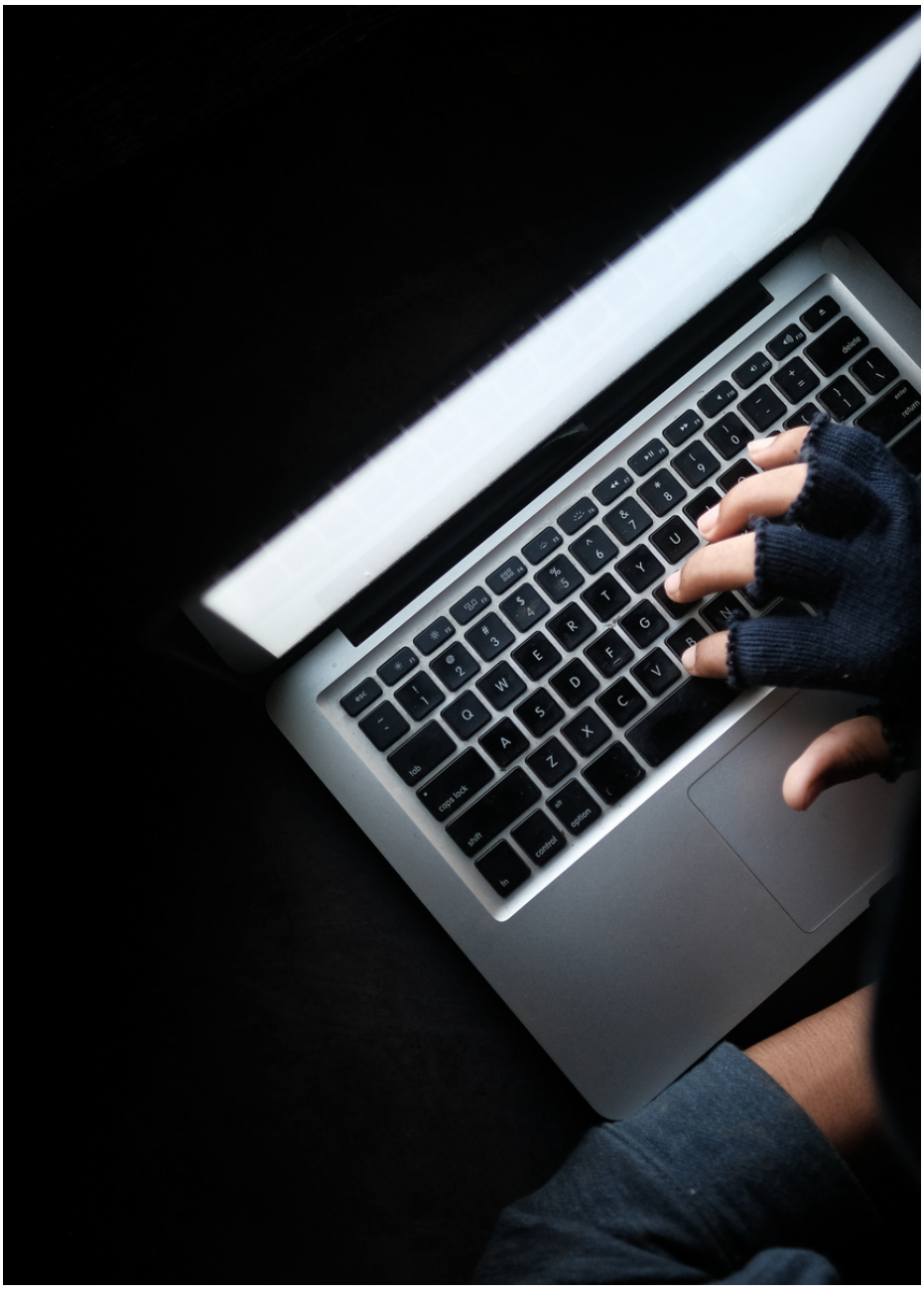
This same technique nowadays is used by many threat actors, since zillions of data about billions of people and organizations is available on the internet and can be accessed from any geographic location at the cost of a digital device and an internet connection. This practice of collecting and organizing publicly available data is called Open Source Intelligence (OSINT). Here open source describes the public nature of the data being analyzed and not the good old open-source software movement, although many OSINT tools are open source softwares.

Organizations as part of their marketing and branding efforts, often create their own social media profiles, adding to the wealth of free and public information online.

Much of this data is posted without confidentiality or other considerations, but organizations are beginning to understand why some types of public information can be a liability. For example, listing official email addresses online can provide an attacker with an email address naming structure of the organization that can then be used in the attacker's next phishing scheme.

Email addresses, domain names, proprietary information, and honest customer reviews are just a few pieces of information often found with some efficient research. With a bit more digging and by connecting the dots, a savvy attacker can identify the security holes that open a door into an organization's network, undetected.
The OSINT tools were built for security professionals to identify new vulnerabilities in systems, so they can be remediated before they are exploited by threat actors, like potential weaknesses in friendly networks exposes anyone connected to that network to potential threats.

One of the prominent use of open-source intelligence by security professionals is to prioritize their time and resources to address the most significant current threats.



At any given moment, an organization races multiple threats and all of them do not require an equal amount of attention. In most cases, this type of work requires an analyst to identify and correlate multiple data points to validate a threat before action is taken.

OSINT is not just limited to preventing cyber threats, it has multiple use cases in various other industries. For example, OSINT is used by Law Enforcement Agencies to collect data from a wide range of open sources, social media, news sites, and surface, deep, and even dark web which helps fight organized crimes, combat human trafficking and collect forensic evidence.

One of the use cases of OSINT, we all have experienced in our lives in the last two years. The COVID help websites that scraped web for the availability of oxygen cylinders, ICU Beds, blood and injections and organized that data at one place for anyone in need, is an example of OSINT since the information was collected from publicly available sources. This is the use of OSINT in disaster management.

With good analysts and more efficient ways to collect and organize big data, OSINT will prove to be a great tool for policy makers and leaders, giving them valuable insights to make better decisions.

Keshav Saini
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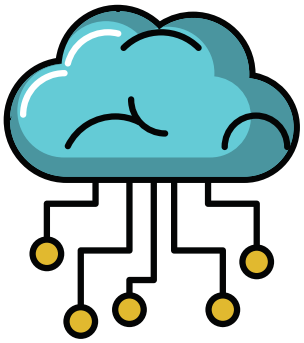
CLOUD COMPUTING AND FUTURE TRENDS



Cloud! Cloud! Cloud!
What is Cloud?

Cloud computing is Internet-based computing in which large groups of remote servers are networked to allow centralized data storage and online access to computer services or resources.

To understand cloud, let's go back a few years. Most things were stored in pen drives and hard drives. Then, JIO, a telecommunication company offered a scheme that provided free unlimited data for a certain time.

Now, where is the data stored besides secondary storage devices like pen drives? Data is stored over the internet, in Google Drive or Dropbox. They maintain backups so you don't need to worry about losing your data or keeping manual backups. They appear as another drive on your computer just as if you had plugged your external hard drive in. Now, Google asks us if we want extra storage (100GB for 130 Rupees per month). This is cloud storage.

A story of servers and data centers

Big companies have massive data centers — buildings full of servers. Medium-sized companies have one room full of servers called the server room.

In addition to data, companies have another problem — they need to estimate how much computing power they'd need on their servers. This is the most challenging part.

Adding more hard drives to satisfy storage needs is the easy part.

Many small companies don't have the money. So they'd leave it to third-party hosting services to manage their servers and data centers.

They get roped into expensive plans. Moreover, they'd need to physically call or email someone when things need to change. With most of these third-party hosts, scaling on demand is not immediate. You have to call it in and go through the process of a subscription plan change.

For large businesses, the problems are in maintaining the servers and providing fault tolerance to guarantee availability round the clock and building out data centers across the globe to be able to serve customers quickly in different parts of the world. In most cases that's not even their core business. Their core business maybe is to sell diapers online!

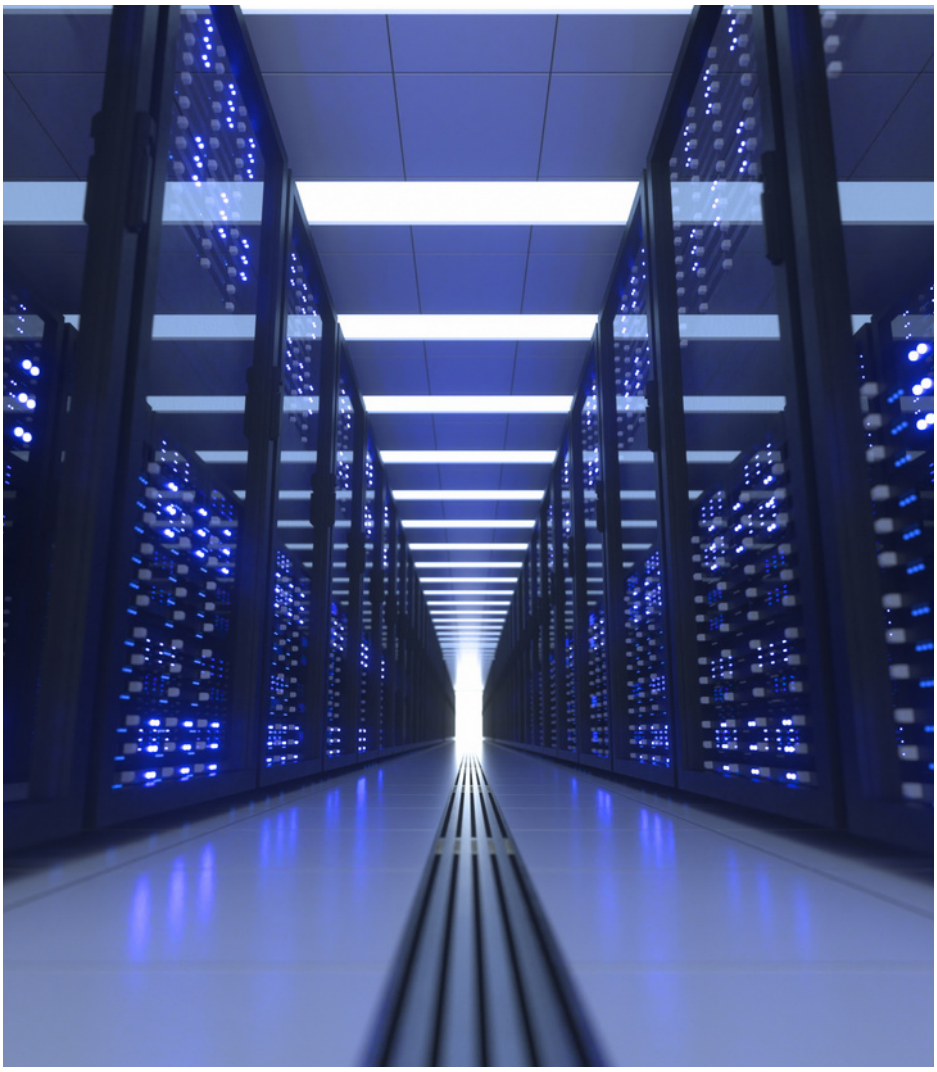
Imagine investing in poultry farming and hiring people who can maintain the farm every day so that you can make an omelet for breakfast!

Moreover, you only paid for the time you used the servers. If your app was love-luck roulette and people only used it on Valentine's Day then you didn't need to pay for servers for the other 364 days!

Even NETFLIX uses AWS as its cloud service provider.

The Cloud (The Savior)

How would you solve these problems for businesses? You buy up warehouses in all the places where real estate is cheap, and then install a bunch of servers on all these locations. Run high through fiber optics cable to connect everything, secure the facility, secure the data at rest and the data on the move. Then start renting them out to businesses. You manage the headache of buying, installing, and maintaining these servers while the businesses can focus on their business.



That's what Amazon did in 2005. Besides selling books online, they spun a new business venture under he Amazon banner and called it Amazon Web Services (AWS).

Now, small businesses could start to make their omelets without ponying up millions of dollars for a data center just to test out a product idea. The entry barrier to software business was lowered, the viability of the business increased, and the time to market which is a critical factor for small businesses was cut down drastically!

To understand even better, let's take an example to understand why cloud is the very best option for developers. Imagine Raj is a person who has created a social media website. Now he wants to host it. He has two options to host it (let's keep count of money), suggested by his friend and by his colleague. Friend suggests he should host it on cloud, while his colleague suggests he should buy his own servers and data storage to host it there. He goes alongside his colleague and he bought a ($10k) server and posted it in his garage. Let's say the Revenue was $0 and Expense was $10k.

Let's say his site is doing well now and traffic is increasing day by day. So he decides to buy another server ($10k). Well, he is earning money now too. So he readily does so.

Revenue - $30k Profit -> 8K$
Expense - 20k$ + 4k$ (Electricity + Maintenance).

He was very happy. Now his colleague asks about the money earned. So the total money he made was $6k in a year. Way less.
Now let's consider a Cloud-based strategy.

What cloud does is that it only charges for the resources you asked. Raj told AWS (Cloud service provider) that he needs some resources (computing power, data storage). They agreed to charge only for that. By the end of 6 months, there was a lot of traffic on the website so he decided to allocate some more resources to the website. He can do that by just going to the AWS website and changing some settings. No physical work is required. And by the end of the year, he sees that he saved a lot of money. The Net profit he earned was around $13k.

We don't just host websites on cloud, we can do many other things like Big Data Analysis, Test and deploy our software, Data Storage and much more.

Future trends in Cloud Computing

Cloud computing virtualization has been surged due to the global pandemic. Cloud computing has been adopted by almost every sector or industry. There are so many new applications that were not possible before. Companies are trying to enhance cloud platforms using the latest tools and technology. So, it is also important to understand the upcoming trends.

Distributed Cloud Computing:

Every country wants to keep data locally and has its own compliances. This laid foundation for a new technology called distributed cloud computing. When multiple clouds are used locally for data storage and processing but server architecture, delivery, operation, governance and update centrally.
recovery, and data protection.
Some of the advantages of distributed cloud are The best example of distributed cloud is the healthcare industry in which we can use hybrid clouds and edge computing for in-hospital and at-home patient monitoring.
instant data transfer, cost-effectiveness, transparent cloud management from a single dashboard, better disaster recovery, and data protection.

Serverless computing:

In serverless computing, anyone can develop and deploy applications without bothering the server. It removes all the barriers that are placed by traditional IT infrastructure. We don't require to buy or rent the server. Instead, the third party will take care of all services for us. The main advantage of serverless computing is that developers can focus on their core responsibilities instead of the underlying architecture.
The advantages are lower cost, reduced liability, no need for system administration, easy operational management, flexibility. Some of the serverless architecture providers are AWS Lambda Microsoft Azure Function Google Cloud Functions IBM cloud function, and .

Cloud AI:

Machine learning especially deep learning models' success depends on the massive data set. The storage and preprocessing of data can be done on the cloud. This paves the way for building, deploying, and managing complex AI applications on the cloud. So those AI applications that generated enormous amounts of data can be scaled up using the Cloud AI platform. It enables better resource utilization and fast computation.

CONCLUSION

If you're a small operator, the cloud will give you a virtual data center and an IT department wherever you are. This means you can open your office anywhere, and your data center comes with you.

For bigger businesses, the cloud will save you money by cutting costs of setting up server rooms, data centers and hiring an IT department.

It gives you reliability, throughput, redundancy, and availability as part of the contract. It makes it easy to share resources between your employees.

Cloud has progressed in leaps and bounds in the last decade. Cloud-first is a revolution that is sweeping across the globe. This is probably the best time to start thinking about what you are going to do with the cloud, have a plan, and start the shift if you already haven't!

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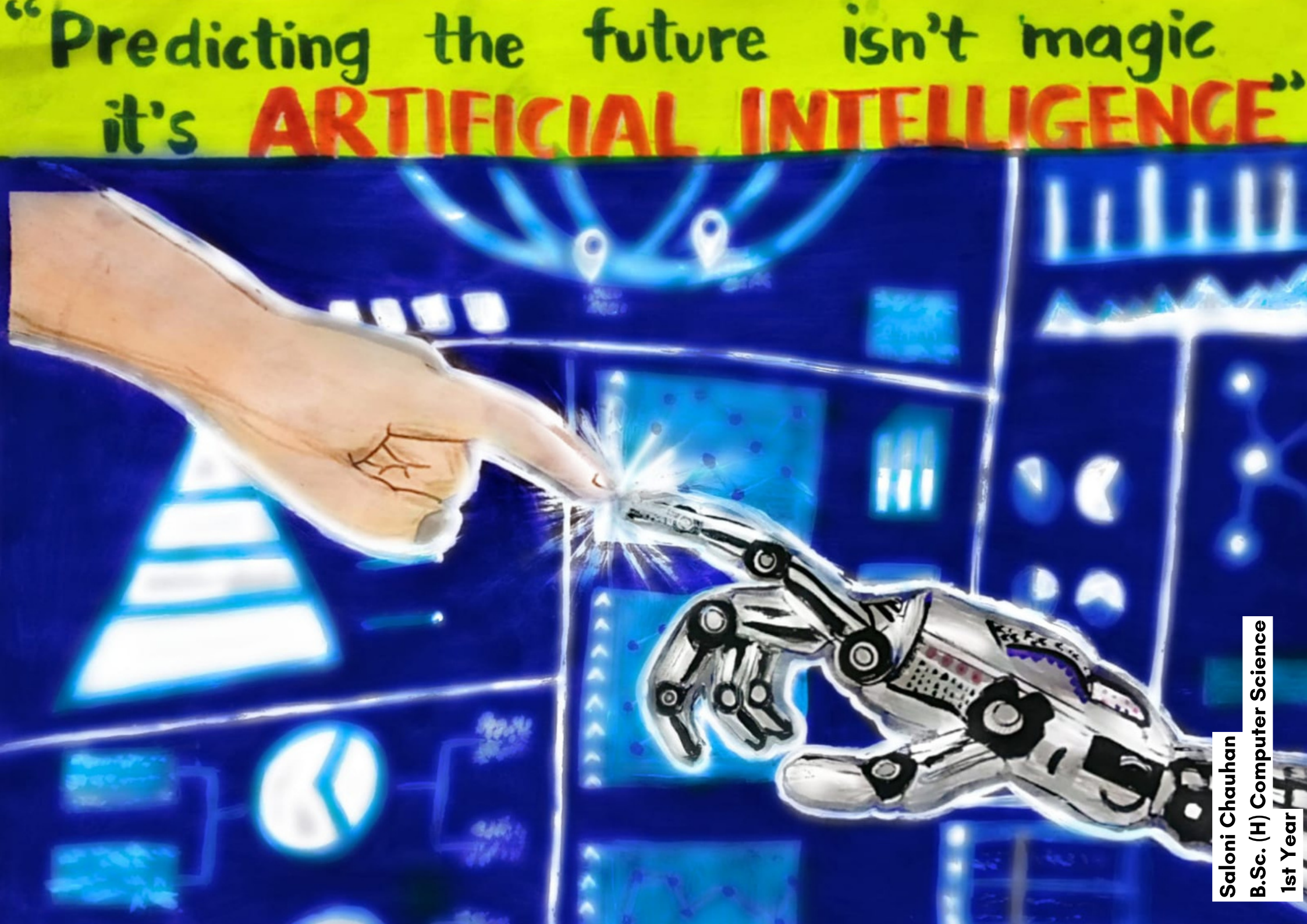
2nd Year


"Predicting the future isn't magic
it's ARTIFICIAL INTELLIGENCE"
Saloni Chauhan
B.Sc. (H) Computer Science
1st Year

MYSTERIES OF HEALTH EXAMINED WITH AI

With the advancement of AI technology, we come to know several aspects of its uses. With AI's Machine Learning it has become too convenient to research and find algorithmic data on several deadly diseases. On a regular basis from across the globe, several health-based research papers are being published by doctors and scientists.

A MIT & Harvard based research team has developed a method to identify patients who are at risk and who are going to be at risk for Atrial Fibrillation from Artificial Intelligence in Harvard's MG hospital. Atrial fibrillation is a common condition that leads to the formation of clots in the hearts that travels to the brain to cause a brain stroke.

The study was published in circulation and according to that "researchers developed the artificial intelligence-based method to predict the risk of atrial fibrillation within the next five years based on results from 45,770 patients data through electrocardiograms.

These electrocardiograms based artificial algorithms assist in identification of individuals at greatest risk for atrial fibrillation," he added continued, professor of medicine at Harvard Medical School Steven A. Lubitz, a cardiac electrophysiologist at MGH and the senior author with an associate member at Board Institute.

In front of neuroscience, how the brain works is the biggest and the most complicated puzzled question. Across the world, institutions are performing research to understand it. And, similarly, Harvard is doing by merging neuroscience and computer science together by the name "Ariadne Project" and

doing reverse engineering with the brain to understand and build an artificial brain, for this AI is playing a very important role in building computer algorithms that replicate the way human brains perceive information and learn.

This research has been conducted by the IARPA (Intelligence Advanced Research Project Activity) through Harvard's John A. Paulson School of Engineering and Applied Science (SEAS) with world prominent universities like Massachusetts Institute of Technology, Notre DAme, New York University, University of Chicago, and Rockefeller University and the research has received more than $28 million till now.

David Cox, the leader of the project, said the “dream team” of researchers involved in the project cross 12 labs in six institutions. And, his entire research is based on making an artificial human brain but currently, he is working with a rat's brain and collecting algorithmic data through ML.

Some researchers are working on fighting against colon cancer through AI technology while some are working on human eye site and neurons and revels visual cortex and on making artificial robotic doctors and health staff because of human healthcare workers shortage but, all this proves AI’s strength and potential and scoop to lead the health sector as while.

AI will be a very prominent weapon to fight against several diseases and play an important role in the medicinal field but the further need is to increase the phase of R&D of AI from a health perspective.

Ayush Kumar Jha
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1st Year

TECHNOLOGY AND CORONA VIRUS

COVID-19 first appeared in China in December 2019, and then spread over 195 countries with around lakhs of cases being reported and thousands of deaths. Novel corona-virus virtually 'locked down' the world and people were practising social isolation and social distancing. Nevertheless, mankind put up a brave fight and used new-age technologies to restore some sanity. These technologies not only help in fighting the health pandemic but also changed our perspective that how will we deal with the recurrence of such health scares. Be it education or the corporate sector,
we cannot deny the fact that, "Technology kept the world running."

VIDEO CONFERENCING

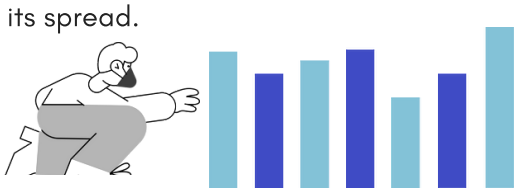
While the Work from home model allowed people to work from the comfort of their living rooms, at the same time apps like Zoom, Skype also ensured virtual meetings to avoid close gatherings at one place. Not only for corporates, it even helped people stay connected with their family and friends and cope with the tough times

WORK FROM HOME.

With the COVID outbreak, the world turned upside down for most of the companies however, later the pandemic allowed employers and employees to set the notion of work from home. The biggest hurdle of the work from home model had been the trust deficit between employees and employers.

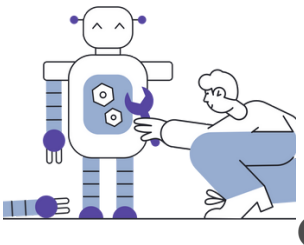
Coronavirus ensured enforced long and sustained work from home working for everyone. This time the work from home model mostly appears to be working well enough to convince employers that it can be the standard working mode. The main reason for this successful transformation has been technology, which is here to stay and improve.

We all have been witnessing the spread of COVID-19 for the past two years. When the people in different parts of the world were locked in their houses, technology flourished. Now there's no doubt in the fact if we say that history bears testimony to the fact that mankind harps on how its superior brain power has led to advancements in technology connecting people around the world.
And, corona-virus has subjected this claim to a rigorous test, as inflating connectivity is proving a boon to its spread.



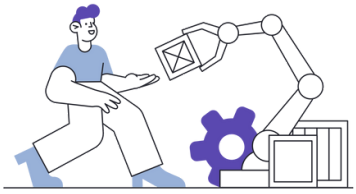
ROBOTS TO RESCUE

Robots proved to be another great child of technology. In some parts of the world, it helped in taking care of patients in isolation wards by serving them them food, medicines, etc.



In China, a robot named "Little Peanut" served food to patients quarantined in a hotel. In Washington(US) , a robot named "Vici" was there to communicate with his care team while he was quarantined. Also, chat- bots are being used to keep travellers updated on the latest travel procedures and disruptions.

AUTONOMOUS VEHICLES AND DRONES:



These are being used to deliver essential goods like foodstuffs and medicines. Drones are also being used to track non-compliance to quarantine mandates, patrol public spaces, and for thermal imaging. A vehicle platform also joined hands with self-driving start-up to deliver supplies and food to big hospitals in Beijing. It made its micro-car kits and autonomous driving cloud services and made it available for free to companies fighting the virus.

TELE-MEDICINE

This technology is a boon for sure. It was being used by a large number of hospitals across the world to safely screen and treat patients from remote places. Not only does it help in times of Corona-virus but also established a good market and people won't hesitate now from consulting doctors online or ordering medicines.

VIRTUAL BIO-METRICS:

Facial and iris recognition solutions integrated with infrared thermometers are increasingly being used for screening, proving another advancement of technology.

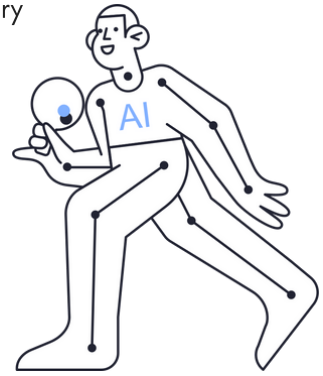
The government and many private companies in India suspended contact-based bio-metric time and attendance systems in the outbreak. And, virtual bio-metrics are still being used to track the movement of suspected infected persons and to quarantine them.

In these challenging times, it is sure that Artificial Intelligence, technology, and data science are critical in helping us effectively deal with the outbreak. On one hand, it is cooperating us in dealing with this pandemic however, at the same time we cannot neglect the fact that last year, we saw the highest number of cyber-crime cases.

As the saying goes, "An empty mind is a devil's workshop" and since most of the people were vacantly locked in their homes, they indulged in these activities which lead to numerous frauds all across the world.

ARTIFICIAL INTELLIGENCE:

AI has helped in diagnosing and developing a cure for the illness. Several hospitals used AI-based software to scan through CT images of patients' lungs to look for signs of infection. The cloud computing resources and supercomputers of several major tech companies were being used to fast-track the development of cure or vaccine for the virus. Several drug companies used AI-powered drug discovery platforms or mined through databases of already-approved drugs to find a cure.



Hence, coming to the question from where we started "Are technology and COVID-19 friend or foe?", we can conclude that technology was and is still the basis on which the world is running since past two years, hence undoubtedly, it is a boon for us.

And now we should let ourselves take it as a hidden opportunity to evolve technology and brace newer challenges with each passing day.

Ishita Rai
B.Sc. (H) Computer Science
2nd Year

All Image Source: https://icons8.com/

Online Learning with Artificial Intelligence.

"Online Learning is not the next big thing, it is the now big thing."

-Donna J Abernathy

Online Education has been prevalent for a few decades now, but the recent pandemic has forced the world to embrace it with open arms. In the current situation, it became the utmost need of the hour, safeguarding the interests of millions of learners of all age groups across the world. Earlier, some teachers who resisted online education, have realized its importance during lockdown. However, teachers and students are required to equip themselves with technology (hardware and software) to adapt to the current situation and to be ready to face challenges posed by online education, so as to make the learning process more effective and productive.

The world is also experiencing a paradigm shift in the teaching/learning process from a linear curriculum-based approach to a more skill-oriented approach. In such a scenario, Artificial Intelligence based learning platforms provide powerful interactive learning environments which attract student attention and also aid in personalized learning of individual students. Major online learning resources like Udacity, edX, and Coursera were born out of the world's top AI labs and headed by AI experts: Sebastian Thrun at Stanford (Udacity), Andrew Ng at Stanford (Coursera), and Anant Agarwal at MIT (edX).

Already, online courses have lowered costs, reduced inequality, and improved graduation rates in education. The AI revolution could further make online education smarter, faster, and cheaper. AI is majorly improving online education providing personalization, intelligent tutoring and virtual facilitators.

Online Learning operates in two modes, asynchronous and synchronous. In asynchronous mode, the online courses are active and available for a specified period of time and till then, the students can join them and learn at their own pace without any real time instructor.

The course content - lessons, pre recorded video lectures, tests and assignments can be accessed by the students enrolled in the course at any time during which the course is active. In synchronous mode, live online classes are conducted in a virtual meeting room where teachers meet together to communicate with their students using audio, video, whiteboard etc. Live classes require students and instructors to be online at the same time. Students may still access online support material, tests, assignments etc as per their schedule and availability.

Personalization means that the e Learning modules have a learner centered design. AI based e Learning systems provide Adaptive Learning where content is customized based on an individual's existing knowledge and needs rather than providing a one-size-fits-all approach. Such systems use machine learning algorithms to track each student's performance and adapt the difficulty level of the content based on his/her progress. Learning in such an environment not only results in effective utilization of a student's time but also keeps his motivational level high. Large number of adaptive learning tools are available and new improved ones are being created continuously for making the learning process more individualized thereby increasing knowledge retention and student engagement.

AI based Intelligent Tutoring systems affect instructor learner interaction in a big way. Artificially intelligent teaching assistants autonomously perform repetitive tasks, post weekly announcements, provide support material and answer routine, frequently asked questions thereby relieving instructors for more productive communication with their students. They provide data insights to teachers to design tailored lessons and automate tedious tasks such as grading tests, resulting in reduced course creation time. Automatic translation is a great example of how Artificial Intelligence is enhancing the content development process, offering more speed and efficiency. Teacher-student interactions are much more productive as these learning systems point out the areas students are struggling with and need help.

AI-powered online education systems are more transparent than human instructors as their approach is more objective rather than being subjective. Self-improvement comes naturally here as one can more easily retrace and analyze the thought process behind a concept.

Chatbots and virtual assistants can help students by answering routine questions, in navigating course material appropriately, in discovering relevant resources based on their profile and topics of interest by suggesting various learning assets, thereby reducing the time and effort required to perform such tasks manually.

As more and more AI enabled online learning systems are deployed, students will be able to learn faster and develop skills that will prepare them for an automated world in the future. Also, with time, such tools will become more fluid and effective.

While AI based learning systems provide enough personalized support, there are some potential threats of such systems which are a matter of concern to both students and instructors. They feel that there is a risk of over-standardizing the learning process and the canned support would have a negative influence on students' learning. It might take away students' opportunities for exploration and learning from their mistakes. Students were also uncomfortable with the invasive nature of some systems which measured their unconscious behavior, such as facial expressions or eye tracking. Also, AI based learning systems can process large amounts of information quickly, but do not respond well to complex contexts. Humans, on the other hand, cannot process information as quickly as AI systems do, but respond intelligently to a variety of contexts.

The bottom line is that online asynchronous education cannot replace live instructors and a balanced combination of AI based learning and human instructional learning is required. In the future of AI-enabled education, teachers, students, and AI developers still have much to learn and AI systems and humans will have to work closely together for the success of these systems.

Dr. Roli Bansal
Associate Professor
Department of Computer Science

Tanya Gupta
B.Com (H)
IIIrd Year

EFFECT OF AI IN OUR FUTURE LIVES

When I was searching about this century's buzzwords, Artificial Intelligence (AI) and Machine Learning (ML), it was quite interesting to know how these technologies are evolving and are expected to transform the approaching future of our lives. So, I have decided to write on the topic "Effect of AI in our Future Lives", so that we all may explore the potential of a new age with ML and AI.

Future of AI – Minimize Artificial, Maximize Intelligent.

"AI is going to change the world more than anything in the history of mankind. More than electricity."

– Dr Kai-Fu Lee, 2018
AI oracle and venture capitalist

AI has advanced quickly, from autonomous cars to voice automation in homes, and it is no longer simply a sci-fi movie or book notion. The future of AI is coming quicker than the forecasts made for 2054 in the critically acclaimed film "Minority Report". According to University of Oxford researchers, AI will be better than humans by 2024 in translating languages, by 2026 in writing essays, by 2031 in selling commodities, by 2049 in writing popular books, and by 2053 in performing surgeries. Thus, AI will become an essential part of our life, surpassing human cognitive abilities.

• Entering the door to your hotel room without using a key, but rather by using face recognition software for which your face will be your identification, making daily communications more convenient and efficient.

• Prepare to have your things delivered to your door by tiny drones within minutes of making an order.

• AI-enabled assistants will make phone calls to arrange an appointment at your parlour, comprehending the implication and context of the discussion.

• Prepare to have a Robot Surgeon operate on you. A robot conducts the operation and assists patients and provides care whereas a physical surgeon will be an observer. These are a few examples of how the world in the future will be affected by the use of AI. Future advances in AI may appear to be a long way off, yet they will arrive faster than one can imagine. Top technology firms are competing to combine AI into our everyday lives, paving the way for an indeed curious and exhilarating AI future.

What Impact Will AI Have on the Future?

Let us discuss how AI will affect the future based on the current scientific developments in AI: The Future of AI in Healthcare.

In the healthcare business, over 86% errors may be avoided, and AI will have a critical role in this. The future of AI in healthcare is a step to standardize healthcare for the assistance of patients as well as healthcare practitioners, making it less expensive and more accurate by using AI-enabled systems. Predictive analytics combined with AI can aid in understanding the different elements that impact a person's health (birthplace, dietary habits, local air pollution levels, and so on). In the future, AI-enabled healthcare systems will be able to predict when a person is almost certainly acquiring a chronic condition and provide preventative measures for treatment before it worsens.

With so much research being conducted on building AI-enabled applications to assist doctors, AI will unquestionably be a game-changer for providing better medical facilities to patients. One can expect a very different future for healthcare as robots will engage with people, examine their health records, and determine whether or not they need to see a doctor. We will still require physicians, nurses, scientists, and so forth. AI, on the other hand, will make our life easier by proactively monitoring our clinical and healthcare data.

The Future of AI in Retail

• By 2022, the worldwide marketplace for AI in Retail is estimated to exceed $5 million.

• According to a Capgemini report on the impact of AI in Retail, using AI across their business processes will save retailers more than $340 billion by 2022.

• According to Accenture, AI investments in retail will increase sales by 38% by the end of 2002.

These numbers demonstrate unequivocally that AI has a bright future for retailers, with a wide range of applications for smarter business decisions. AI-enabled drones will soon be able to carry items up to 5 pounds in less than half an hour. Amazon has already started to work to ensure the safety and steadiness of such operations for delivery, but there is no set deadline for commercial deployment of these drones. However, in the coming decade, you might expect autonomous delivery of commodities through drones.

Not only is the future of AI in Retail more individualised and autonomous, but it also includes realistic scenarios such as connected dressing rooms with screens, virtual racks customised according to data-defined personas, and a lot more personalization based on past history and trends, making consumer choices less chaotic and stressful.

The Future of AI in Banking

The worldwide commercial value of AI in Banking is expected to reach $300 billion by the end of 2030, according to IHS Markit's AI in Banking research. AI is likely to take centre stage in the coming decade in industries such as corporate intelligence and security, reducing costs, increasing productivity, and improving consumer experiences. Robo Advisors in wealth management will become commonplace and game changers in the banking arena, saving wealth managers and consumers substantial amounts of time. Future banks will not only personalise their services and goods, but will also employ AI to personalise consumer experiences. Personalisation may be as simple as not requiring you to show your ID card when you walk into a bank branch and still being greeted with your name and comprehensive knowledge of your whole checking account history.

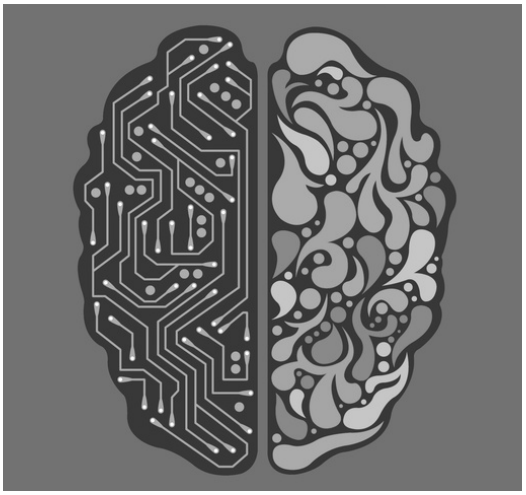
AI Will Create Millions of New Job Opportunities

"AI will take our jobs!" is the most widespread concern about the future of AI. With AI automating all types of labour, we might imagine a more pleasant future for ourselves, one that creates new employment rather than displacing them. According to the World Economic Forum's Future of Jobs study, AI will produce 58 million new AI jobs by 2022. There is a good likelihood that by 2030, AI will surpass humans in most mental activities, but this does not imply that it will eliminate jobs.

In fact, the Indian AI business has more than doubled in size since the previous year. In only one year, three times as many organisations have begun to work on AI-based initiatives, and this trend is expected to continue. India nearly quadrupled its AI engineers in 2019 (from 40K in 2018 to 72K in 2019), yet there is still a skills deficit. Professionals shifting into AI engineer jobs by upskilling themselves through different mentored AI courses are driving the expansion of the Indian AI sector.

The Future of AI is on its way — and it's coming soon! Now is the instant to take a position in education and training to organise for the age of AI. The decision is yours: will you enhance your abilities to keep ahead of the curve, or will you remain static in the industry? Aren't you looking forward to being a part of the fourth industrial revolution? Any AI Course will help you to upskill and obtain a top AI job at a top tech company. Wishing you the best for your future.

Dr. Vinita Jindal
Associate Professor
Department of Computer Science



FROM THOUGHTS TO REALITY

Brief history of AI

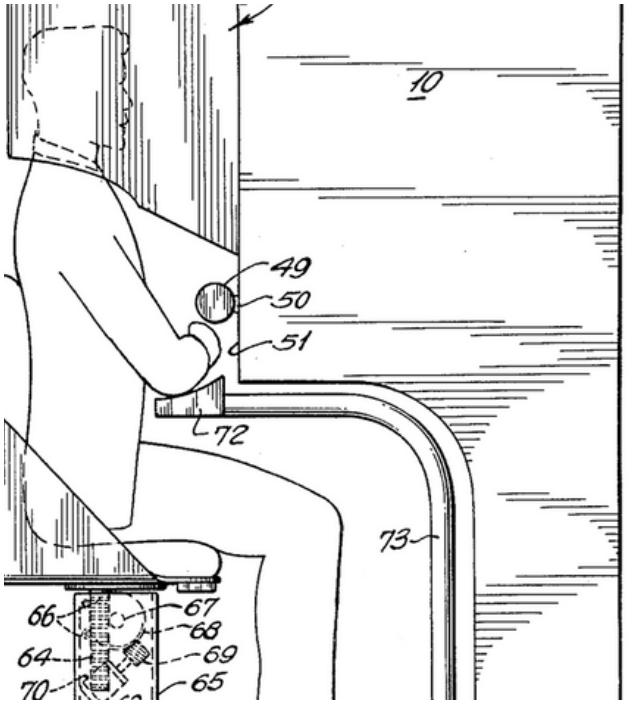
Since time immemorial, humanity has always had a deep rooted curiosity to understand their meaning, the reason for their existence and the process or the entity that made it. While the question of “Who” is discussed quite a lot, an equally intriguing question is “How”. How do we function, how do we comprehend, and how do we respond, these are equally fascinating and important for the search of our origins. In the quest to understand all of this, an idea was born somewhere in someone’s mind, an idea that was equally crazy and great. An idea put forth by Warren McCulloch and Walter Pitts, in 1943, by giving a model of “artificial neuron”. Also known as the McCulloch-Pitts neuron, it is still the base reference for the modern neural networks.

From 1943 till now, it took a long time for research in this new and interesting field to develop into fairly usable, or to be more exact, easy to comprehend results. Even if the Technologies relating to the field of artificial intelligence were being used in varied applications like making NPCs in games, simulations and the likes, in recent years it has now come out to play a more active role in our day to day lives. The culmination of all the research into this field birthed Sofia, the robot that lives. While Sofia might be an effort of bringing human-like behavior into machines, bringing human behavior and interaction into the digital world is an equally researched topic. This is what led to the creation of Virtual Reality.

” Although the concept of a Virtual World was not new, Why did it not gain widespread attention until recently? ”

" The internet is no longer a set of interconnected systems, rather the world itself is the internet "

Earlier, Virtual reality was just considered as a technology that will let us move from our typical 2d flat screen to a bigger platform allowing us to sense the object in terms of more than just visual perception, including feel, or hear. The first ever device that implemented this idea was “Sensorama”, made by Morton Heilig in 1957, who was a cinematographer. This was just a compartment with a screen for visual perception, oscillating fans for touch and speakers for hearing perception. Earlier Virtual Reality systems had output in the form of stimulating the user’s senses, but they could not interact with the user’s commands. It was just an enhanced version of a movie theater. It was only after 1966 when Thomas Furness built a flight simulator using this technology that the various uses of an interactive virtual reality dawned on people.



By Morton Heilig - Figure 5 of U.S. Patent #3050870 (via http://patft.uspto.gov/),PublicDomain, https://commons.wikimedia.org/w/index.php?curid=3616641

With the advantages of Virtual Reality drawn out, researchers started researching on how to overlay this virtual world onto the real one to make it more interactive. This resulted in the creation of Augmented reality, a technology that enables virtual objects to be overlaid into the real world. This was a result of the advancement in Artificial Intelligence, enabling the devices to project images and the like into the real world effectively.

Before moving further, let us look at the various utilities of Augmented Reality combined with Virtual Reality:

Games

1. Laser Tag: A primal example of using virtual and augmented reality along with smart devices, laser tag is a physical sport played in form of a Real time first person shooter, where players wear jackets that has sensors and use a gun to shoot at the jackets, making use of the real world landscape and using augmented gameplay to shoot.
2. Beat Saber: One of the modern games, this is played by projecting a virtual environment into the real world and the user uses a hand movements recording sensor to strike various obstacles generated in the world. A perfect example of interacting with an augmented virtual world using "smart" devices

Simulation

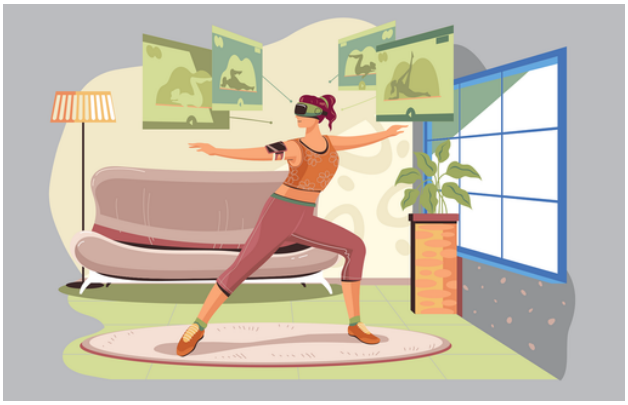
Virtual Reality is often best used for simulating scenarios, and it can also be used to train pilots with the help of a combination of both.

With the availability of large amounts of data, and intelligent devices with vast data manipulating capabilities, it is now possible to combine both the virtual and real aspects of both the Virtual and Augmented environments to create a mixed reality that lets us interact with a two way system. This creates a huge variation in the applications of Mixed reality systems, such as:

Medical

The use of VR/AR in the medical field saw rise only recently. Using AR to display the vitals of patients directly to the doctors helps them do any surgery better.

As the interaction and experience increase in a mixed reality system, the capabilities of a training system increases. It is also possible to perform virtual surgeries for Doctors to learn and train.



" The breakthrough in Mixed realities came when Mark Zuckerberg announced his project "Meta", the next level of internet "

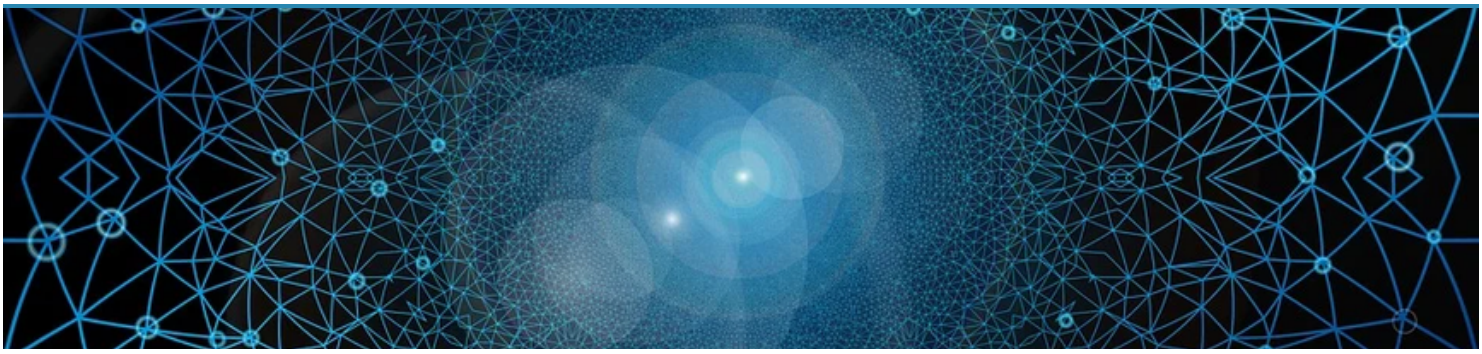
The MetaVerse

With the onset of Extended Reality, the internet itself, which was just a digital world some time ago, can be made into a virtual world, a world that can be interacted with as if you are present there physically, and this brings us to the "MetaVerse"
Metaverse is a project brought forth by Facebook's Mark Zuckerberg.

Metaverse promises to revolutionize the internet, making it a virtual world which can be accessed using a sensor(like any virtual reality headset) . People can talk, party or even play games together even if they are miles apart, and it will still look and feel like they're right in front of you. This is all possible by integrating Real world data, into a virtual world and then using that data to augment it to some far away place. All the data is transferred using the smart devices that have the capability to learn and adapt to their surroundings. While Metaverse isn't the first of its kind experience, as Microsoft's HoloLens is also capable of using mixed reality capability, what separated Meta is the sheer amount of services it provides:

1. Workspaces: A collaborative workspace in the virtual world
2. House: A place you can call your home in the virtual world
3. Environments: Build different worlds and invite people to them to interact with
4. Game: Play together in the physical world using AR.

Ashish Sharma
B.Sc. (H) Computer Science
3rd Year



MY TECHIE PA

A few years down the lane,
I scorned Programming
As every time, I tried it,
I ended up with red swollen eyes,
spurting out tears,
sometimes full of vexation
while other times of accomplishment.

I can recall, data types always seemed
bed of roses to me
But, when the text in the bold
Demanded the use of Classes
I ended up with an erroneous outcome
My Brain questioned, “Why?”
But for younger me,
It remained a mystery

As I grew a little,
I can recall I cherished playing with arrays
But, when then that big-eyed caricature
Dissolved the linked list in
The question
I messed up badly Miss questioned, “Why?”
And little me,
Added it to the list
With the previous mystery

Finally, years later
I felt so blessed to be
A euphoric child of Computers
But then,
Mr. DS entered
With his beloved—
Hashing and trees
Writing codes using them

Was an arduous task
And, I being an inscrutable child
Never really relished it
The brain asked,
When others can, why can't you?
Inner soul replied, "Shh! It's a mystery

The other day
When I was
Lying steady in a corner
lost in this old not-so-technical world,
The door creaked, and
In the faint light of my table lamp
I could see a
Fuzzy phantom gazing at me
Awestruck I was, and
The phantom banged my head
"Welcome to this bitterly sweet world, Darl!"
You have reached the margin of
the yellow woods
Now, proceed and ace"

My perplexed face was stuck
And wide-opened eyes
Questioned his existence
Heartily, he continued,
"My dearest naive angel,
You can call me Pa
The Techie Pa

You condemned me hard
But I adored you more
You tried fleeing
But I clenched your wrist
You are precious and gullible
But the world isn't"
And, I nearly dozed off
As I saw the cloudy 'he' vanishing

The very next second,
I was in another world
Which was even more fascinating
Than any imaginary heaven
I could twist up in my head
"Oh, Wait! She's me, the younger me
But, what's 'he' doing here?"

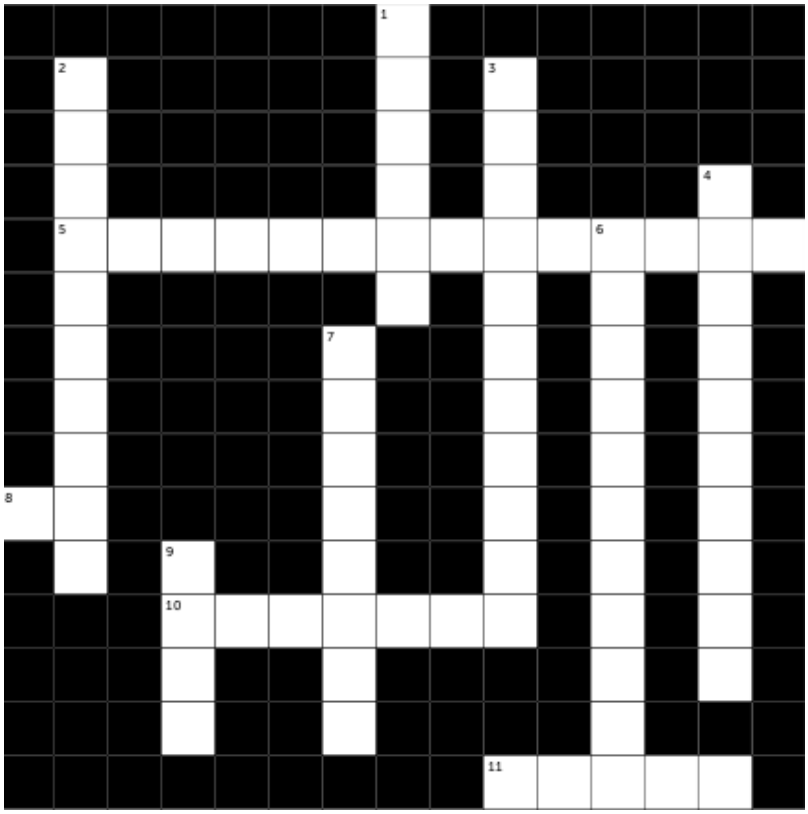
And then,
All those mysteries started
Seeming so magical.
Still, It was a Jigsaw, which needed
To be arranged
While I was lost in this
Sea of questions,
A film featured in my cerebrum
Where I could see my Phantom Pa
Telling younger me
"You write the program,
You run it,
You get errors, you retry,
You excel at it,
A new challenge comes,
You learn it, you run it,
You get the desired output"

And, here this one film
Was enough to answer
Those limitless mysteries
That were pounding in my mind
For the past few years
Stupid I, detested Phantom Pa
While he was determined to
Make his daughter strong-willed.

"And, You may sometimes fail terribly.
That's Okay!
If a problem is more challenging,
just start smaller
And you don't need to know
How to solve a problem before
You begin.
At least, BEGIN
Life is like Programming, my dear", said
My Phantom Pa
As he kissed my forehead
And bid me adieu
before
he snapped his fingers
And brought me back to my senses

Ishita Rai
B.Sc. (H) Computer Science
2nd Year

Test your Trivia



ACROSS

5 computing high in the sky

8 desire to understand their origin

10 name of the project by the Harvard to merge neuroscience and computer science

11 viru sahastrabuddhe

DOWN

1 programming language named after a comedy group

2 chain of blocks is called

3 what coding is done on CodeChef

4 the process of translating plaintext into ciphertext

6 person that take part in an action that is intended to cause harm to the cyber realm

7 keeps your computer safe from hackers

9 what value uniquely identifies a block in blockchain

Keshav Saini
B.Sc. (H) Computer Science
2nd Year

Answers on page 66

FUTURE PROSPECTS OF B.Sc(H) COMPUTER SCIENCE

Computer science is a stimulating discipline that focuses upon the core elements of computers and computational systems along with futuristic technology, programming and networking. Aspirants all across India and abroad choose a degree program in computer science at either undergraduate or postgraduate level. CS inculcates data system management through knowledge, design ideation, and IT development.

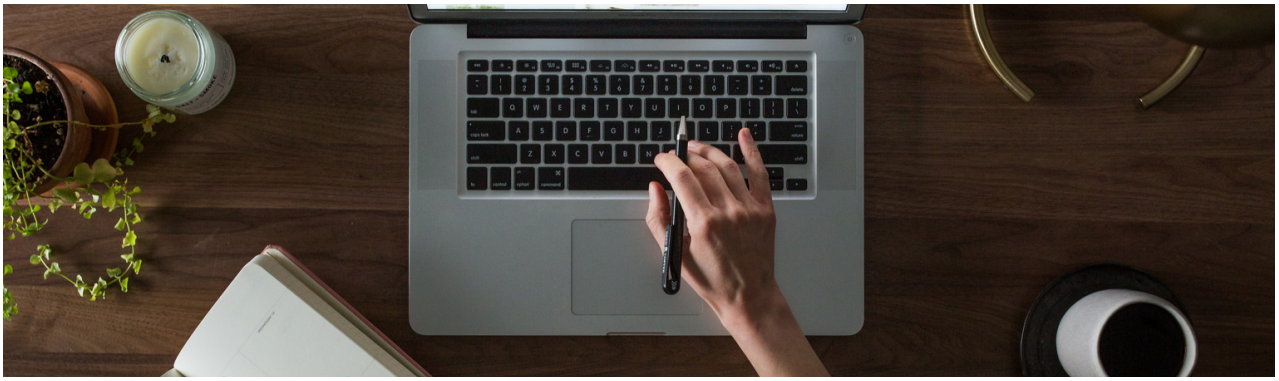
Machine learning, Data Science, Blockchain Development, Artificial intelligence, Robotics, Augmented and Virtual reality are some foundational developments that have taken place recently. This has further widened the horizons for the future.

B.Sc. (Hons.) Computer Science paves a path for you to enter the IT Industry. It is a 3-year full-time undergraduate course divided into 6 semesters, with each semester lasting a period of 6 months. This programme primarily intends to serve as an input for higher degree academic programmes in Computer Science.

After the completion of the B.Sc. degree, students often wonder, “What to do after B.Sc.?” or “What courses can be pursued after B.Sc. (Hons) Computer Science?” or "What are the future prospects?"
Here are the answers for you.

As a B.Sc. graduate, you can either opt for further studies or directly step into the job sector. If one wants to pursue higher studies after completing graduation in B.Sc., there are future prospects for it. You can enroll yourself in a postgraduate-level degree program in your respective field or subject.

Here is a list of some top courses you can pursue after B.Sc(H) computer Science



1. Master of Science (Computer Science)

M.Sc. is one of the courses after B.Sc. and the duration of M.Sc. programs is two years. This is the most obvious choice for B.Sc. graduates for higher studies. an M.Sc. degree includes specializations in respective fields.

Since an M.Sc. degree introduces students to both advanced theoretical concepts and practical skills, after completion of the course, you'll have a particular degree of scientific and professional competency that is necessary for this cut-throat competitive market. Obtaining this degree is crucial if you would like to travel for further studies in research like Ph.D.

After completing M.Sc. in computer science, there are various career opportunities available like Business Manager Development, Software Quality Analyst, Data Scientist, Software Developer, Software Test Engineer, Technical Support Engineer to name a few.

There are many universities in India and abroad offering this course. One can get into them after clearing an entrance exam, the syllabus of which generally includes mathematics, English, logical reasoning, quantitative aptitude, and computer.

Some of the top Indian Universities offering MSc. Computer Science are:

- University of Delhi, Delhi.
- Banaras Hindu University, Varanasi.
- National Institute of Technology, Tiruchirappalli.
- South Asian University, Delhi.
- Jamia Millia Islamia, Delhi.
- Panjab University, Chandigarh.
- International Institute of Information Technology, Hyderabad.
- Indian Institute of Information Technology and Management, Kerala.
- Banasthali Vidyapith, Banasthali.
- Jadavpur University, Kolkata.

2. Master of Science (Data Science)

The 21st century will be dominated by data. Data science has become an integral part of many companies and industries. Companies are using for competitive advantage in pricing strategies or product development, improved operational efficiency, and minimized risk exposure through accurate forecasting models.

Analysts predict that the country will have more than 11 million job openings by 2026. To fulfill this demand, some universities have started specialized courses in Data Science. After completion of the degree, you can join as a data scientist, data engineer, data analyst.

Some of the Universities/Colleges offering MSc. (Data Science) are:

- Loyola College, Chennai.
- Vellore Institute of Technology, Vellore.
- Chandigarh University, Chandigarh.
- Fergusson College, Pune.
- Christ University, Bengaluru.
- Jain University, Bengaluru.
- Annamalai University, Chidambaram

3. Master of Computer Applications

Just like M.Sc., MCA may be a postgraduate-level course that solely focuses on computing. Unlike an M.Sc. program, the duration of MCA courses is three years. The course is usually fragmented into six semesters, with each semester lasting for six months. Specialization fields in MCA include Systems Management, Systems Development, Systems Engineering, Management Information Systems (MIS), Networking, Application Software Development, and Hardware Technology.
Software Developer, Programmer, Software Architect, Software Consultant, computing system Analyst, Technical Consultant, Database Administrator, Hardware Engineer, Web Designer/Web Developer, and Project Manager are a number of the foremost popular job roles for MCA graduates.
The top institutes in India offering MCA are NITs, DU, JNU, JMI, BHU, VIT, BITS, TIET, etc. Every institute conducts its own entrance exams. NIMCET is one such examination, conducted by NIT (National Institute of Technology), one of the most prestigious institutes of technology in India. The syllabus for NIMCET includes mathematics, LR, QA, English, and computer.

4. Master of Business Administration

It is usually a two-year program and one among the popular courses after B.Sc. Master of Business Administration is a professional degree that aims to impart theoretical and practical training for business administration or finance management. The goal of this specialized program is to help candidates gain a comprehensive and in-depth understanding of the standard business administration and management operations.

MBA is a good option for a candidate who is more inclined to take up leadership and managerial roles. You need to give the Common Admission Test (CAT) to apply for MBA degrees in numerous colleges and universities. Your CAT Score determines which colleges you'll enter.

Some of the top Universities/Institutes offering MBA courses others than IIMs are:

- Faculties of Management Studies, University of Delhi.
- Management Development Institute, Gurgaon.
- XLRI -Xavier School of Management, Jamshedpur.
- Institute of Management Technology, Ghaziabad.
- Vinod Gupta School of Management, IIT Kharagpur.
- Department of Management Studies, IIT Madras.
- Shailesh J. Mehta School of Management, IIT Bombay.
- Narsee Monjee Institute of Management, Mumbai.

Make sure you make your choices according to your interests and what you desire to learn. Best of luck for the future!

Garima Bothra
B.Sc. (H) Computer Science
3rd Year

Team BLITZ

Left to Right: Dr. Sumit Agarwal, Mr. Sudhir Kumar Gupta, Ms. Jyoti Kumari, Dr. Bhavna Gupta

Farhan Akhtar

Simrat Deol

Somya Gupta

Tushti Adlakha

Gaurav Hira

Udit Kaushish

Smrati Sharma

Agam Gupta

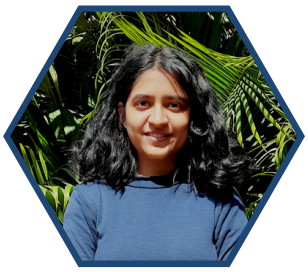
Diksha Singh

Harshita Mahajan

Shruti Sharma

Team e-Blitzine

Left to Right: Mr. Pradeep Kumar, Dr. Roli Bansal, Ms. Rashmeet Kaur Chawla



Akshita Gupta

Ashish Sharma

Keshav Saini

Shivanshi Gupta

Smrati Sharma

Abhishek Chandy

Ayush Kumar Jha

Chetan Yadav

Dhavni

Teaching Staff
Department of Computer Science

Left to Right

Top Row: Mr. Sumit Kumar Baberwal, Dr. Sumit Kumar Agarwal, Mr. Sudhir Kumar Gupta, Mr. Ravi Kumar Yadav, Mr. Pradeep Kumar

Middle Row: Dr. Bhavna Gupta, Ms. Rashmeet Kaur Chawla, Dr. Roli Bansal, Ms. Jyoti Kumari, Ms. Nidhi Passi

Bottom Row: Ms. Indu, Dr. Namita Aggarwal, Dr. Anjali Thukral, Prof. Priti Sehgal, Dr. Richa Sharma, Dr. Vinita Jindal

Non-Teaching Staff
Department of Computer Science

Left to Right: Ms. Pooja Chawla, Mr. Rajesh Wadhwa, Ms. Anuradha Chaddha, Mr. Lovkesh Jairath, Mr. Ritesh Gupta, Mr. Akhilesh Kumar

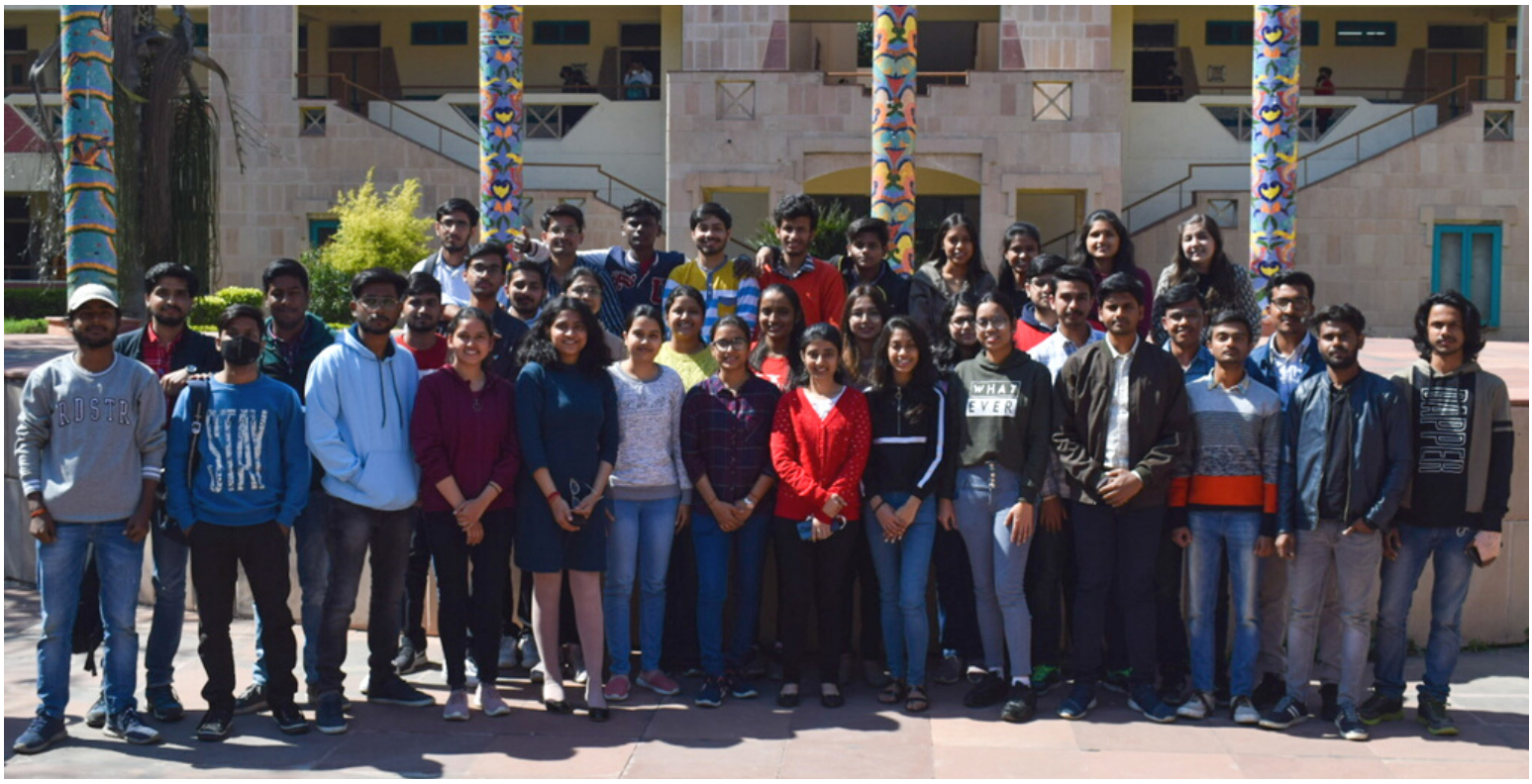
First Year Students

Batch of 2021-2024

Second Year Students

Batch of 2020-2023

Third Year Students



Batch of 2019-2022

BLITZKREIG 2022

EVENTS

Code of Hogwarts Mystery

Let's Get QUIZZICAL

ML Mania

Conquer Destiny

Kryptos

Posteriva

Answers for crossword:

Across

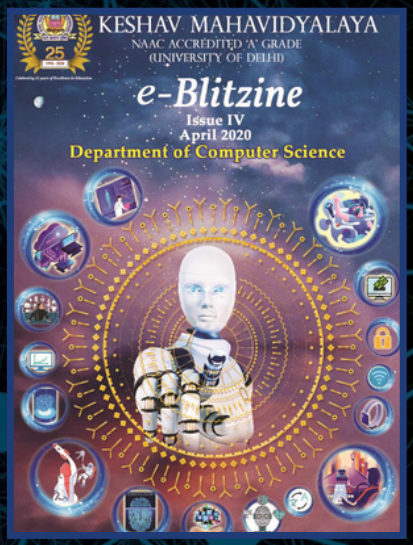
5. cloud computing
8. ai
10. ariadne
11. virus

Down

1. python
2. blockchain
3. competitive
4. encryption
6. threat actor
7. firewall
9. hash

Our Previous Editions

Year 2021



Year 2020

Year 2019

Year 2018

Year 2017

BLITZ Society

Department of Computer Science

Keshav Mahavidyalaya

NAAC Accredited 'A' Grade

University of Delhi

H-4-5 Zone Pitampura, Near Sainik Vihar,Delhi-110034

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