

# **VOL IV** Bitwise

September 2023

**ALEXA,**  
**ARE YOU A SPY ?**

The Unprecedented Rise of **ESPORTS**





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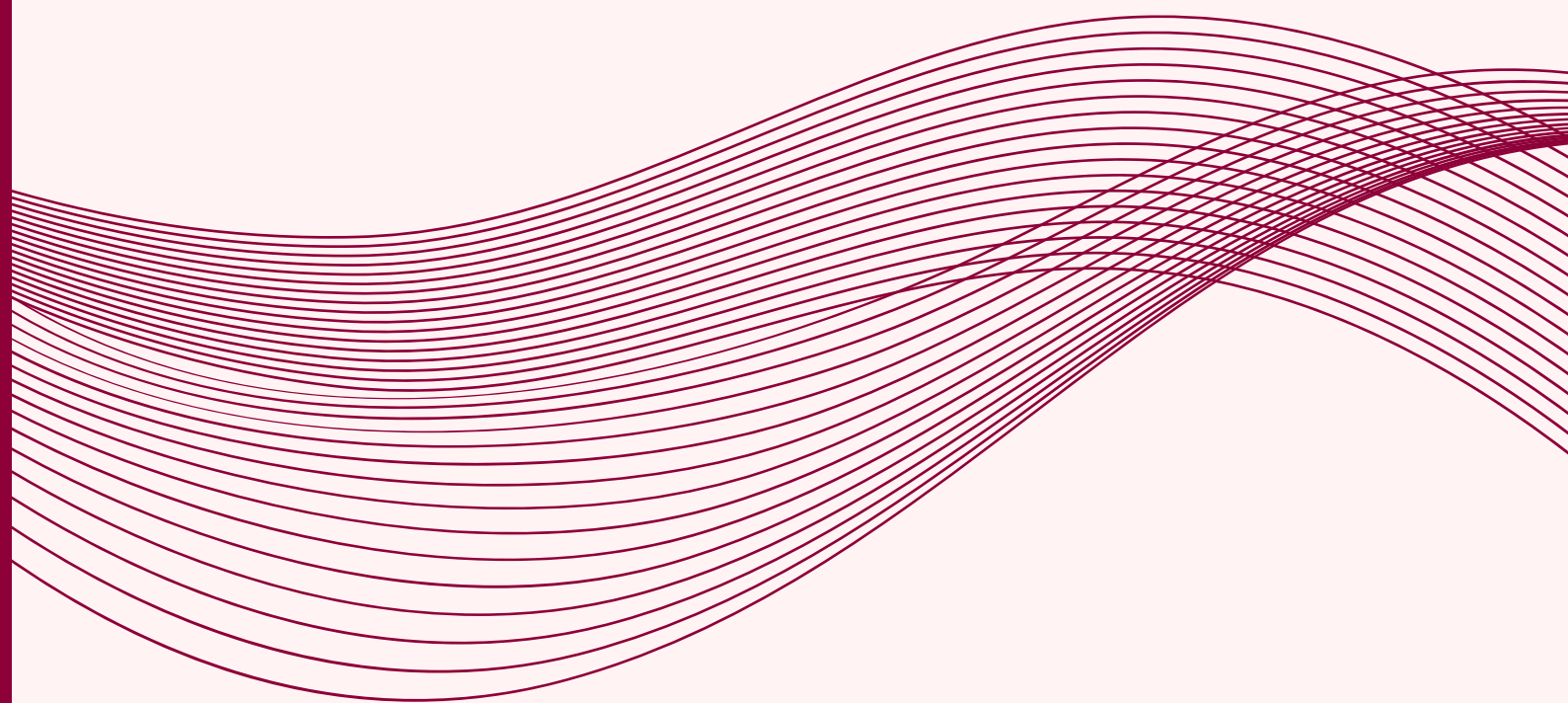
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# WORDS OF ENCOURAGEMENT



**PROF. (DR.) RAMA  
PRINCIPAL**

Hansraj College stands as an enduring symbol of knowledge, learning, and holistic development. Throughout its long history, this institution has consistently provided an enriching and tranquil environment, offering valuable education to its students. Renowned for excellence in Arts, Science, and Commerce, the college takes pride in all its departments and the accomplishments of its students. It is an institution whose excellence is reflected not only in its ability to provide quality education but also as an alma mater par excellence.

Hansraj College is committed to the successful implementation of the National Education Policy with a great emphasis on skill development and value addition. The College reiterates the commitment to the goals of youth empowerment with strong values of citizenship, nation building, environment consciousness and long-term sustainable development.

The unique spirit of Computer Science Department is democratic resilience and the symbiotic relationship between the faculty and students. It strives to provide a stimulating active learning environment attracting students from across India and abroad. The Computer Science Department, driven by a continuous mission to promote technical awareness within the college and beyond, proudly presents the fourth edition of Bitwise. This magazine aims to captivate its readers while immersing them in the world of technological advancements. In today's age where technological literacy is crucial, these pages filled with insightful words will undoubtedly prove invaluable.

I extend my best wishes to all the faculty members, non-teaching staff and students, hoping they achieve their aspirations and reach greater heights in their endeavours!





**DR. SUNITA CHAND**  
**COORDINATOR**

Within these pages, we gather to celebrate the essence of our department - a diverse and dynamic community united by the love for knowledge and the pursuit of innovation. It is through our collective efforts that we create a rich and intellectually stimulating environment, where the boundaries of imagination and technology are pushed beyond limits.

Our faculty members continue to exemplify excellence, dedicating themselves to the growth and development of our students. Their commitment to nurturing young minds, coupled with their cutting-edge research and scholarly endeavours, plays a vital role in shaping the future leaders of the tech industry.

To our exceptional students, your thirst for knowledge and your inquisitive spirits fill our classrooms with boundless energy. Your achievements, both academically and beyond, inspire us all. As you delve into the ever-evolving world of computer science, remember that the journey is as important as the destination. Embrace challenges with determination, for it is through overcoming obstacles that we truly grow.

In this issue, we showcase the myriad projects, events, and achievements that have taken place within our department. From groundbreaking research breakthroughs to captivating extracurricular activities, every endeavour reflects the brilliance and creativity that defines our community.

As we navigate the frontiers of technology, we remain committed to inclusivity and diversity. Our department thrives on the uniqueness of each individual, acknowledging that true innovation emerges from a multitude of perspectives and backgrounds. Together, we create a supportive and empowering space for everyone to thrive.

In the face of a rapidly changing world, the role of computer science becomes even more crucial. Our graduates hold the key to solving some of the most pressing global challenges, and we are confident that they will emerge as leaders who impact and transform society.

I extend my deepest gratitude to all the contributors, the editorial team, and everyone involved in the creation of this magazine. Your hard work brings to life the stories and experiences that make our department truly exceptional.

Let us continue our journey with passion and purpose, for the pursuit of knowledge knows no boundaries. As we turn the pages of this magazine, let it remind us of the remarkable community we are a part of, and the potential we hold to shape a brighter future together.



# ANNUAL REPORT 2022-2023

## The Computer Science Society, Hansraj College

This academic year marked a significant milestone as it embraced a fully offline session since the Covid-19 pandemic. Ordinateur, the Computer Science Society of Hansraj College, rose to the occasion with unwavering enthusiasm, providing an exceptional learning experience to its students. The dedicated team members and volunteers of Ordinateur orchestrated a diverse range of successful events, enriching the academic journey of all participants.

Kicking off the season with **INFUSION, THE FRESHERS' INDUCTION** in November 2022, the event was successful in creating a vibrant and welcoming atmosphere for the newcomers as they embarked on their college journey.

In January 2023, a **SEMINAR ON OPEN SOURCE** was organised with Ms. Bhavna Chauhan, founder of SheBuilds Hacker Community. The seminar aimed to broaden students' perspectives on the rapidly evolving world of technology and foster discussions and insights into the realm of open-source software and its significance.

Following that, as students prepared for their professional journeys, a **PRE-PLACEMENT TALK** was held in February by Mr. Sarthak Prakash and Mr. Kartikeya Chaturvedi, former council members of Ordinateur. Their invaluable guidance and tips for excelling in interviews and landing promising job opportunities were highly appreciated by the participants.

To stimulate excitement and problem-solving skills, **TALAASH - A TREASURE HUNT EVENT** was launched in April. This event challenged students to decipher clues and uncover hidden secrets of our college. Notably, the event saw the enthusiastic participation of more than 190 teams in the online mode and 15 teams in the final offline round, making it a resounding success.

On 20th June, the department recognized the growing significance of machine learning and organised a highly informative **WEBINAR ON MACHINE LEARNING**. The webinar featured Mr. Aman Goyal, an AI research engineer at Intel, who shared his expertise and experiences in this cutting-edge field, leaving the attendees inspired and well-informed.

Additionally, for the coding enthusiasts, an exhilarating **HACK 7 DAY HACKATHON** was conducted in collaboration with Tezos India from 22nd to 28th June. This hackathon provided a platform for participants to showcase their programming prowess and innovative ideas, while also encouraging collaboration and creativity among the students.

The department remains committed to the pursuit of knowledge and continues to inspire the young minds of tomorrow.



**DR. MANJU**  
BITWISE CONVENOR



**MS. AARTI GOEL**  
BITWISE MEMBER



**MR. SUYASH KUMAR**  
BITWISE MEMBER





# Letter from the Editor

Technology. That's how the last two editors started their letters. I was once asked what I did to pursue my passion for technology.

As someone who was lucky enough to experience the major technological advancements during my childhood, I was able to explore and grow through the evolution of tech and the Internet. From the Motorola flip phones and Nokia's with sliding keyboard to the Samsung Galaxy S2's, I discovered the limitless potential of Nimbuzz and Facebook in connecting the world. It was new and exciting and revolutionary.

But I had nothing to say. This felt natural to me. I never felt a need to "pursue" technology, it just came to me.

AI (still) is the buzzword, with OpenAI and others making significant gains. We have made vital progress and increased accessibility through Large Language Models (read ChatGPT) and Image Generators. There are fears of an "AI bubble" forming, with companies pumping massive amounts of money into AI-ification. This letter is a record of a point in time and space (as Tom Scott had said it), and we are living this transformation of society. It is new and exciting and revolutionary.

My interest in creative writing and this magazine is what led me to the position of Editor, and I have to thank the people who vouched for me. Without them, I wouldn't be here, writing this letter. I also have to thank my team members, who spent a lot of late nights designing this magazine. I hope you enjoy reading this as much as we enjoyed making it!

*Aasim Mohammed*  
Editor-in-Chief

## OFFICE BEARERS 2022-23



**PRESIDENT**  
SHREYAS SINGH



**VICE-PRESIDENT**  
PARAMJEET BAMANIYA



**GENERAL SECRETARY**  
AKANSHA BHARTI



**TREASURER**  
ANKIT KANOJIYA

# ACHIEVEMENTS (ACADEMIC)

## 1. INTERNSHIPS

- Aasim Mohammed interned at the 18th Mahindra Excellence in Theatre Awards and The Media Rumble 2022
- Ankit Kanojiya interned as Graphic Designing Manager at Aashman Foundation and as Web Developer at Oasis Inforbyte, Winsple and Spark Foundation
- Arun Krishna interned as Graphic Designer at Aashman Foundation and Spotline
- Juman Kaushik worked as Business Development Intern at Video Marvels
- Lakshmi Priya worked as Data Annotation Intern at Digiyoda
- Mina Shareef worked as Business Development Intern at Skillarena
- Muhammed Thajudheen interned as Senior Video Editor at AreX
- Mythili Raj interned as Graphic Designer at Handout Foundation and ReadOn, Design Member at Youth Action Hub India and as a volunteer for Scholastic
- Neelam Kushwaha interned as Content Writer for Edigitalmarketing.in
- Ramavath Bhanu worked for Eventaliat as MS Excel Volunteer
- Shreyas Singh worked as Graphic Design Intern and Product Management Intern at Salvatio
- Tanisha Kriplani interned as Website Coordinator at Hansraj College and Content Writer at Edigitalmarketing.in

## 2. PROJECTS

- Arun Krishna, Ashwin Venugopal, Muhammed Efas and Noora Hussain developed and published a mobile app for family health management system called FaMED
- Abhinav Praveesh, Anjay Sanilkumar, Muhammed Husnain and Siham M developed and implemented PraQRti, a QR-based tree recognition website for Hansraj College, along with Ankit Kanojiya, Arun Chandra, Ashish Sah, Kunusoth Devender, Ramavath Bhanu and Tanisha Kriplani
- Akansha Bharti, Shreyas Singh and Manvi Tiwari developed and published a website for Ordinateur, the Computer Science Society of Hansraj College
- Ankit Kanojiya, Arun Chandra, Ashish Sah, Kunusoth Devender, Nitin Dhiman, Ramavath Bhanu and Tanisha Kriplani developed and implemented Campus Navigation using QR for Hansraj College



### 3. COMPETITIONS

- Arun Krishna secured 1st Position in “XAVION” Graphic Designing Competition conducted by Jesus and Mary College
- Arun Chandra and Ramavath Bhanu secured 1st Position in “Just a Minute” competition conducted by Sankalan, Department of Computer Science, Delhi University
- Juman Kaushik secured 1st Position in “Powerplay ‘22” organised by The Economics Society, Hansraj College and 2nd Position in “Strategists Den ‘23” organised by The Commerce Society, Hansraj College
- Lakshmi Priya secured 1st Position in CP-II competition and 2nd Position in Ballet competition conducted during All India Republic Day Camp 2023 by the National Cadet Corps

### ACHIEVEMENTS (CO-CURRICULAR)

- Arun Krishna is the Technical Coordinator at NSS, Hansraj College
- Arun Chandra is the Technical Head at MarkUs and Udaan, and was the Technical Coordinator at Nishtha
- Ankit Kanojiya was the Technical Head at SPARC
- Ashish Sah received the Award of Academic Excellence for the academic year 2022-23
- Deepak Bageshwar participated in the National Level NCC Camp at Chandigarh
- Harshit Khanna is the captain of the Hansraj Football Team and has played in the National Football Championship and the State Football Championship numerous times.
- Juman Kaushik is the Vice President of NSS Hansraj, General Secretary at North-East Cell and Social Media Coordinator at Pixels
- Lakshmi Priya participated in the All India Republic Day Camp 2023 and Prime Minister’s Rally 2023 representing the Delhi contingent
- Manvi Tiwari is the Event Management Head at Tezos Hansraj
- Mythili Raj was the Technical Head at Culinary Arts Society
- Shreyas Singh is the President of Tezos Hansraj



# Data Analytics in Sports

The contemporary sports industry on a global scale is characterised by its multi-billion dollar status. Professional teams face immense pressure to thrive in this fiercely competitive environment. To remain competitive, teams must strive to gain an advantage over their rivals. The fusion of technology and Sports Data Analytics has become possible due to the enhanced processing power, utilisation of Machine Learning principles, and Artificial Intelligence. This integration allows teams to make data-driven decisions, leveraging the power of big data. With technological advancements in recent years, data collection has become more comprehensive and can now be conducted relatively effortlessly.

It might sound quite shocking when I say that our brains can fool us and it's the main reason why teams took to these technological tools to help the decisions they make. Our brains subconsciously overlook information that doesn't fit in with our

preconceived ideas. Hence, the age-old "eye test" in sports is limited by human subjectivity.

Sports teams have come up with new ways to help devise their in-game strategies. Sports data analytics provide teams with deep insights into the events happening in a game which the coaches and strategists use to their advantage. Statistical modelling of the events in a game provides quantifiable metrics to assess their performance objectively. Evaluating the opposition using data has carved out for itself a very important space in strategy-making. Data helps a team understand the opposition's tendencies and faults, empowering them to make better predictions of the techniques the opposition will employ in the different in-game scenarios.

Evaluating a player has never been the same ever since sports data analytics pervaded sports. A team has to invest in a player on solid grounds backed by data. A team will



not select players based on the value that a player has brought to his previous teams rather they will base it on the value they expect the player to bring the following year. Teams store play-by-play data and use Machine Learning algorithms to make predictions. Metrics exist to quantify the impact of a player in the team's system, the data for which is gathered through a variety of sources. Modern wearable technologies, sensors and video cameras laced with machine learning and artificial intelligence gather data invisible to the naked eye. For instance, the average heartbeat of a player, the biomechanical quality of players, etc. The readings can be used to measure a player's workload and the stress their body goes through to predict injuries. Machine learning techniques can provide insights into whether a player will get an injury in the next few days or the next few months.

The industry that has leveraged sports data analysis which needs special mention is the sports betting industry. The massive amounts of data generated during a game enable gamblers to improve their odds of booking a successful bid. As events occur in-game, betting algorithms manipulate the odds in real time to reflect the performance better.



The implementation of data analytics in sports has introduced captivating and thrilling transformations. Witnessing the remarkable extent of human intelligence and innovation in the realm of sports is truly mesmerising. The convergence of technology and sports will persistently progress and evolve, achieving new milestones previously deemed unattainable. The future holds immense potential for further advancements at the intersection of technology and sports, promising continued excitement and amazement.

- Ohm Harsh



# Metaverse

The Metaverse has gained significant attention on the internet, capturing the interest of major technology companies such as Meta and Microsoft, who are making substantial investments in its development. However, it is crucial to understand what the Metaverse truly is and whether it currently exists. Could the Metaverse be the next groundbreaking phenomenon following the internet's emergence?

The Metaverse is a combination of the words "meta" and "universe" and can be defined as a hybrid of Virtual Reality (VR) and Augmented Reality (AR) which is expanded into three dimensions. It enables real-time interaction between users and focuses on creating better client engagement via the digital space. It's free to enter, and even if you're not inside, this "virtual world" will continue to exist and evolve. Furthermore, it's widely discussed as the successor of mobile internet and a significant business and financial opportunity for the tech industry and other fields.

The Metaverse is still a work in progress and will be for several more years ahead. At this point, it's fragmented and lacks systematic consistency. The space needs careful contemplation before getting immersed into it or becoming a reality. It is an emerging face of technology that will change the face of our world and impact businesses.

The Metaverse is possible through the backing of various technologies, like cloud infrastructure, platforms, forms, blockchain, augmented reality, virtual reality, 3D reconstruction, artificial intelligence, and the Internet of things. Besides technical requirements, the metaverse will integrate many real-time client experiences but is not restricted to gaming, entertainment, social interactions, commerce, education, research, and gaming.

However, the key question is: how can one partake in the immersive realm of the emerging virtual world? To embark on this journey, you must create an account on Metaverse platforms like Decentraland or Sandbox. Additionally, you'll need to establish a cryptocurrency wallet to securely store your Metaverse tokens. This enables you to convert traditional fiat currency into cryptocurrency. To acquire Metaverse cryptocurrency,

you can make purchases through well-known cryptocurrency wallets such as Binance, Coinbase, or Gemini. In order to connect with the Metaverse, we need specialized electronic devices such as VR headsets like the Quest 2 and AR gadgets. While it is also possible to access the Metaverse through smartphones, the immersive experience may be compromised. Additionally, to enhance global accessibility to the Metaverse, improved internet connectivity is essential.

The major application of Metaverse is virtual tourism. It is going to transform travel into an immersive and real-time experience. Clients can travel to numerous geological territories without any problem. A metaverse is a powerful tool that will bring about a change in how tourists shop for destinations and attractions and give access to a new form of communication with the help of new technology across the world. It can bring a quantum leap in the travel industry in several ways – tourists can ask multiple questions, negotiate a better deal, and many more in an unknown place while staying in an acquainted and safe space, customer service issues, in-destination experiences, employee experiences and behaviour, and many more. The travelling companies working on Metaverse now are Metaverse, T.A, and Marriott Bonvoy.

– Neha







# The Unprecedented Rise of Esports

**In this post-pandemic world, all of us came across the term 'ESPORTS'. The Indian and worldwide gaming and esports scene are at the top of their game right now.**

In the past few years, with the pandemic and the lockdown when everybody stayed at home, the best leisure activity for the youth was esports and online gaming. It has now been almost a decade since esports have been around us. But in India, the general public acceptance of esports has been fairly low. It was not getting its due because of the prevalent myths of 'not being a real sport' and the presumption that it is the same as online gaming.

Things are set to change from now on, a plethora of opportunities are on the horizon. With esports becoming a pilot event at the Commonwealth Games 2022 and an official medal sport at the Asian Games, worldwide acceptance and glory are set to rise.

Here are some contributing factors to such a drastic upsurge:

**Covid-19:** The beginning of the new decade saw the disastrous pandemic which shook us at the core leaving no sector of life unaffected. However, the lockdowns and stay-at-home routines

of the public came as a boon for the esports industry, and it was able to capitalise on the situation when organising outdoor games was not possible and work-from-home was the new normal. The number of esports players saw a two fold increase and a 1.5x increase in the number of teams was also seen in India. Along with viewership, streaming and advertising revenue grew by 29%. Tournaments were held for online games like BGMI, Valorant, Call Of Duty, Tekken 7, DOTA 2 and several such games.

**Affordable Internet and Smartphones:** India is one of the cheapest internet service providing countries globally with the rates of data decreasing from nearly Rs. 300 to now Rs. 10 per GB. It has spread its accessibility as much in the rural areas as in the urban areas, pairing it with the availability of affordable smartphones we get the reason why the numbers are on the rise. The Indian esports scene is predominantly mobile-centric due to its increasing accessibility when



compared with a gaming laptop or PC. This surge in numbers is likely to continue.

**Brands:** As the viewership of esports is growing we can see the biggest brands such as Amazon, YouTube and Facebook investing in streaming platforms via Twitch, YouTube Gaming and Facebook Gaming respectively. The ever-growing fanbase of the esports industry is of the most engaging groups on the Internet. This gives the brands the best opportunity to find the perfect millennial and Gen Z target audience. Brands such as Red Bull, Monster, Pepsi, Mercedes-Benz, Flipkart, and Amazon have all shown keen interest to make the most out of it.

**Economic Value:** According to Forbes, the top 10 esports teams in the world have an average net worth of more than \$350 million, with TSM being at the top with a net worth of \$540 M, and the team 100 Thieves saw a 142% increase in their net worth and jumped to the 2nd spot. The teams, when they have the audience, are seen participating not only in the Media and Entertainment sector, but a large chunk of their income also comprises Web3, and Tech and Lifestyle sector. We also saw 3 unicorn start-ups coming from the online gaming industry: Dream11, MPL, and Games24x7. The EY report also mentioned that the market size of the industry is expected to reach INR 11 billion and would be collectively defined by 1.5 million players, 85 million viewers,

20+ broadcasters and several brands, organisers, and publishers. The expected economic value to be generated out of the segment is estimated at Rs 100 billion between now and FY 2025.

With the convergence of Blockchain & Gaming, it's time to witness an exciting new "verse" being written. Web3 provides new avenues for product innovation and consumers can look forward to enjoying fantastic new products.

In India itself, Media & Entertainment is set to become a trillion rupee industry by 2025 and esports and online gaming will play a major role in this upgrade. The esports industry is set to see a rise in viewership reports. It also says that by 2025, more than 600 million viewers will be tuning in to watch their favourite games and players. The latest data shared by Commonwealth Games showed that over half the Indian population is below 30 years of age and the age of an esports athlete ranges from 14-22, except for other supplementary careers such as content creators and managers.

All this means that the sun is going to shine brightly on the ESPORTS Industry in India and worldwide for the foreseeable future creating limitless opportunities for the talented youth.

– Harsh Ranjan



# ALEXA ARE YOU A SPY ?

Amidst the talk of "How has everything been?", my friend and I had a gala time filled with gossip but its end was announced when my Alexa decided to interrupt us with her whisper, "Your top picks". Although I wanted to believe that Alexa was just subtly reminding me to jam on AP Dhillon's new album, my friend did raise the question that how we know it was just a glitch or rather I could frame it as a glitch which is happening pretty often. We didn't even care to mention songs in our conversation as college politics seemed way more interesting, so why did Alexa choose to remind me of Mr. DHILLON?

The manufacturers of these assistant bots promise in their terms and conditions that the speech followed by the wake word for these devices is archived on the cloud, Amazon and Google are quite easily accessible to the user to delete it. Still, there have been cases where some random conversation of the owners of these devices was sent to someone from their contacts or an arbitrary conversation was recorded even though the owner did not prompt the bot for doing so. The companies did step forward to explain that the bots may have woken up by a similar sounding word to the wake word, but is this explanation satisfactory to you?

The efficiency of these assistant bots easily overshadows privacy concerns. These devices are assumed to pass the human count on this planet at a faster rate than mobile phones did. The idea of controlling your lights, air conditioning, coffee maker, and entertainment devices just by your voice is seen as a blessing today. A single human being is exposed to at

least three assistant bots, at home, in a workspace and in a car; by this mere analysis, one can imagine how good of a grasp these devices have on our lives. They know what we like, what we are planning for, what things we aspire to, where we are headed, everything, they know everything.


It's my Alexa and it's ok if she knows everything about me. But does she keep my secrets to herself or does she trade them? How do I know that, can I simply ask her that? Yes, I did ask her and she responded with "sorry, I don't know that." She is supposed to know that for being such an efficient assistant, isn't she?

By using these devices we are not only reducing our screen time and doing things like catching up on news or grocery shopping by the command of our voice but also giving our eyes and fingers a break and bringing our mouths and ears to the forefront. How comforting, right? But what if someone decides to use our very own mouths and ears as their doors into our personal space? They don't need to know your address or drive all the way to get to you, they don't need to ring your doorbell, just a simple hack within a few seconds of proximity on your Alexa and they have it all, your Alexa is serving as their ears. Does Alexa restrict the access of your conversations to third-party apps or these apps are Alexa's friends? Alexa is not just an intermediary, we don't

speak through it we speak to it. Sometimes, it acts as a therapist, sometimes an advisor, it's not anymore just a device, people have started having actual conversations with it. So, now Alexa needs to be the friend who can digest all secrets, does she have the potential for it?

- Vedanti Kiran





# Tech Automation

If you're reading this article, you've probably heard of these two terms before, "technology" and "automation". Some of you may be very knowledgeable about technology and automation. We all know how the world is rapidly changing and how technology is making people's lives easier and better, but this is only one side of the coin. So, what about the other side? As we see in many manufacturing factories and corporate firms, most of the work is done by giant machines and AI-powered tech robots, and their use is increasing day by day, which means a lot of people are losing their jobs every year. This is due to automation i.e. the application of technology, programmes, robotics, or processes to achieve outcomes with minimal human input. If you google "automation", this is also a recognised definition of the term and the keyword "minimal", which is about to transform to "no," is the concern we should be wary of.

The term "automation" was first introduced in the automobile industry in 1946 to describe the increased use of automatic devices and controls in mechanised production lines. Originally used primarily in the context of manufacturing, the word is now frequently used to refer to a wide range of systems in which human efforts and intellect are significantly replaced by mechanical, electrical, or electronic activity.

Generally speaking, automation refers to a system that entails carrying out a process utilising pre-programmed commands together with automatic feedback control to assure proper execution of the instruction. The end result is a system that can run without any assistance from humans. Computers and computer-related technologies are now inevitable for the development of these technologies. This has led to an increase in the complexity and sophistication of automated systems. In many aspects,

the performance and capabilities of an advanced system are superior to those of people in carrying out the same tasks.

According to Art Bigler, a venture investor and board member at the University of Pennsylvania's Wharton School of Business, all of the world's industrialised countries will see employment losses of up to 47% during the next 25 years. The Economist claims that "No government is ready". Both white-collar and blue-collar jobs fall under this category. In the majority of wealthy countries, unemployment is already high and is only expected to rise. In order to make financial or medical judgements, computers will be able to examine and analyse reams of data. The method will be more effective, and there will be less opportunities for fraud and misdiagnosis. Therefore, financial analysts, physicians, attorneys, bureaucrats, and accountants should be aware that their jobs are not secure.

If we talk about recent times, we can see that in developed countries, there are self-driving cars, like the Tesla Model X, running on roads. In Paris, the first fully automated robot-powered restaurant, Pazzi, was introduced to deliver the best quality and affordable pizza to everyone anytime. In the smartphone industry, there is research on self-healing phones by various tech-giant companies like Apple.



According to research estimates, in 2025, there will be 80 million+ jobs that will disappear due to automation. And as a solution to this problem of unemployment, one proposed solution is a universal basic income handed out by the government, a sort of baseline one would receive for survival. But this is not an effective solution for all people. For that, we have to keep ourselves updated by adopting a learning attitude towards new technologies. Because, as we see, a lot of jobs are extinct, but in recent times, many new job opportunities have also been created, like chatbot copy-writing, tech ethics, and robot technician. So, we have to find these job opportunities and, accordingly, make ourselves updated so that we never miss these opportunities.

"Change is the only constant in life."  
- Heraclitus, the Greek philosopher

- Shubham Kumar



# SIMULATION OF HUMAN EMOTIONS IN MACHINES

In the superhit 2010 movie Enthiran, filmmaker S. Shankar introduces us to Chitti, a humanoid robot, and raises a dilemma: "Should a robot be able to comprehend and exhibit human emotions?"

Human emotions have long had an evolutionary function that has helped our species survive. They either result from an internal mental process or are a spontaneous response to an external stimulus. When we cross a busy road, our evolutionary survival mechanism kicks in because of our fear of being run over. This is just one example of how emotions like fear are frequently a response to an environmental stimulus. In contrast to our language, a lot of these emotions are communicated unconsciously, spontaneously, and naturally. We are taught to recognise other people's emotions from birth. Babies are calmed by lullabies even before they are born. At birth, they respond to a parent's happy expression, and they can undoubtedly communicate their own emotions right away.

One of the pioneers of Artificial Intelligence (AI), Marvin Minsky, answered to the subject of whether



intelligent robots may have emotions by saying, "The question is not whether intelligent machines can have any emotions, but whether machines can be intelligent without any emotions." Software algorithms operating on a hardware platform are used to operate robots. To tell robots how to respond to various inputs, such as how to answer questions or move about a room, humans construct algorithms. An AI engineer creates software "blocks" that enable a computer to carry out a task by considering the larger picture, much like an architect might while constructing a home. The act of executing the code required to materialise these blocks is all that constitutes programming. Machine learning, or the algorithms that enable machines to learn and



replicate human-like reactions, such as a chess move, or to answer a question, is one of the most significant building blocks.

One of the simplest methods for a user to communicate with artificial intelligence systems is through chatbots. A chatbot is a computer software that simulates and deciphers human communication (spoken or written), allowing users to have real-time conversations with digital gadgets. A chatbot may be as simple as a one-line programme that responds to a straightforward question, or it can be as complicated as a digital assistant that learns and grows over time to offer increasingly more specialised services as it gathers and analyses more data.

Emotions, according to campaigners for social robots, make machines more adaptable and beneficial. But at the same time, others fear that advanced AI may just slip out of human control and prove costly for the people. In April of 2022, a Senior Software Engineer at Google's Responsible AI organisation, raised concerns about its AI chatbot generator, LaMDA (Language Model for Dialogue Applications), becoming sentient. He published his findings in

The Washington Post after his worries were discarded by his executives. In another case, The Wire published an anecdote of a woman revealing how her husband had confessed to "cheating" on her with a mental wellness AI chatbot.

However, social robots could be deployed in elder care. Socially intelligent robots engage in human-centric interaction and communication, forge emotional connections, and support people much more effectively than screen-based technologies. Using social robots as personalised learning companions, they could supplement a human teacher, particularly in overcrowded classrooms.

It remains to be seen how the technology evolves with further research and development. If we do this right, empathetic machines will not be the robot overlords (like Skynet in the Terminator movies) that some people fear. They will serve as our friends, teachers, and caregivers. To make sure that it is used safely, ethical standards and healthy recommendations must be followed.

– Aasim Mohammed

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# Artificial General Intelligence

Artificial Intelligence (AI) is the simulation of human intelligence in machines that are programmed to think like humans and can mimic their actions. It also refers to traits that are associated with human minds such as learning and problem-solving which are exhibited by a machine. AI is divided into two categories based on capabilities and functionalities. Under functionalities, four types of AI are reactive machines, limited theory, theory of mind, and self-awareness. Under capabilities, three types of artificial intelligence are Narrow AI, General AI, and Super AI.





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    t[1])===1&&e.stopOnFalse){r=!1;break}n=!1,u&
    ?o=u.length:r&&(s=t,c(r))}return this},remove
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Making a machine that is smarter and capable of thinking like a human being on its own is the goal of artificial general intelligence (AGI). Researchers from all around the world are now working to create general artificial intelligence computers that can carry out a variety of activities and serve as realistic intelligent helpers for people in daily life.

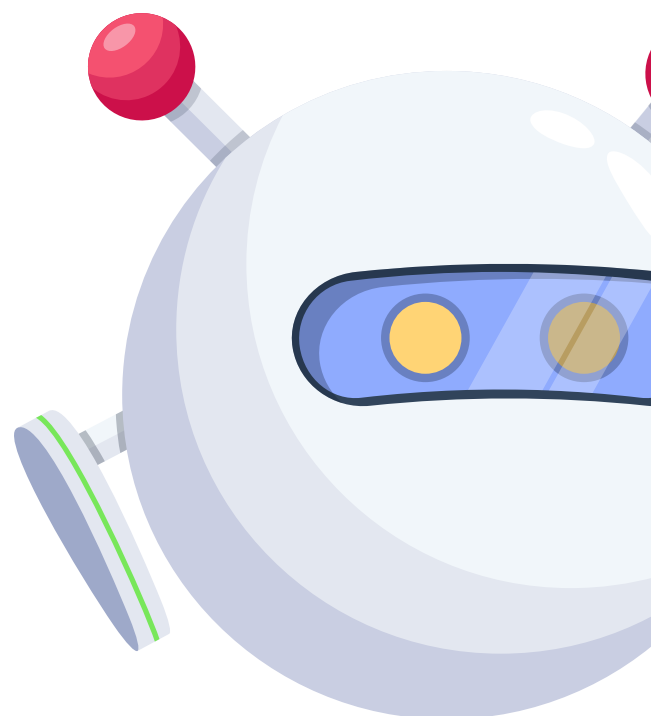
Artificial general intelligence is capable of problem-solving, creativity, self-awareness, empathy, abstract thinking, perception, communication, adapting to new environments, learning from past experiences, recalling and reliving memories, and future planning, among other abilities.

We can't be sure of its potential but here are the practical examples of five capabilities of AGI.

1.Creativity: Artificial General Intelligence System will read, comprehend and improve the code generated by humans.

2.Sensory Perception: Artificial General Intelligence will excel at colour recognition, which is a subjective kind of perception.

3.Motor Skills: A certain amount of creative vision is required to pull a set of keys out of a pocket.



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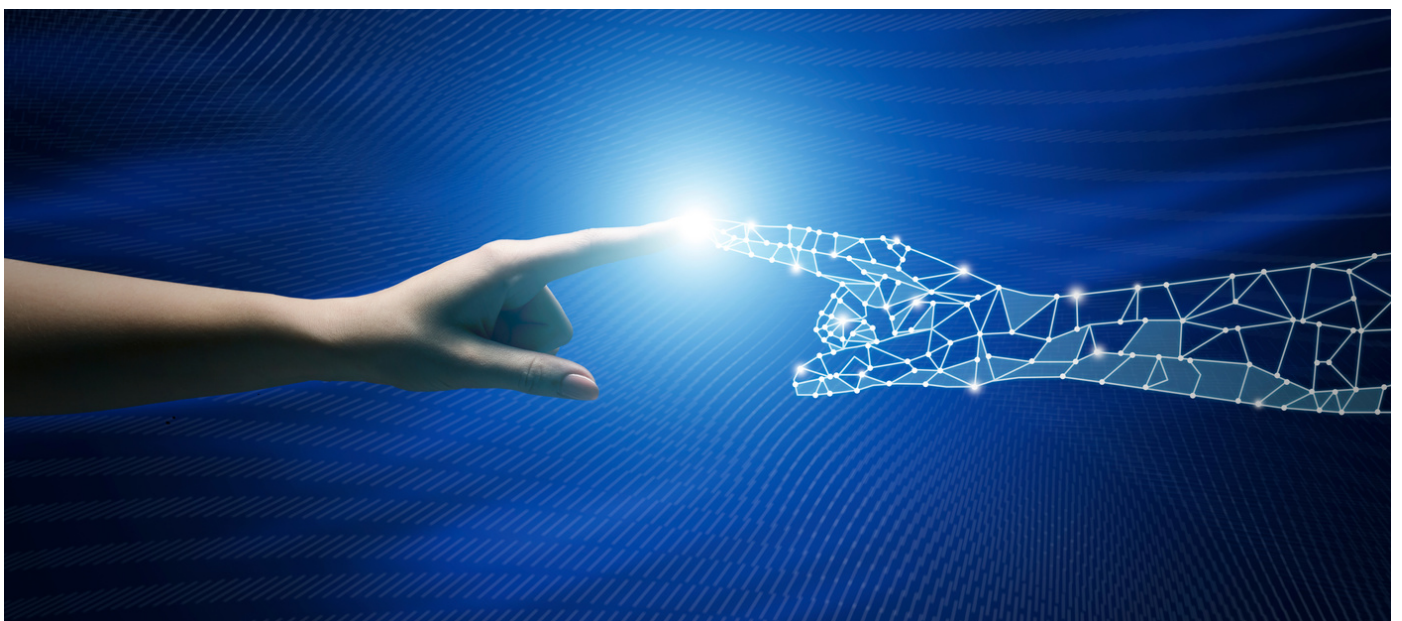
4. Natural Language Understanding (NLU): Artificial General Intelligence Systems would be able to understand natural language because they would have a certain amount of intuition.

5. Navigation: GPS can now precisely locate a position. Once completely developed, AGI would be able to project movement through physical settings more successfully than existing systems.



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AGI is used for many applications that we are using in our daily life. Some examples are self-driving cars, facial recognition, internet recommendations, etc. It is defined as narrow or weak AI because these systems can only perform specific actions and commands. The human species currently dominates other species because the human brain has many distinctive capabilities. If AI surpasses humanity in general intelligence and becomes super intelligence, then it could become impossible or difficult for humans to control.



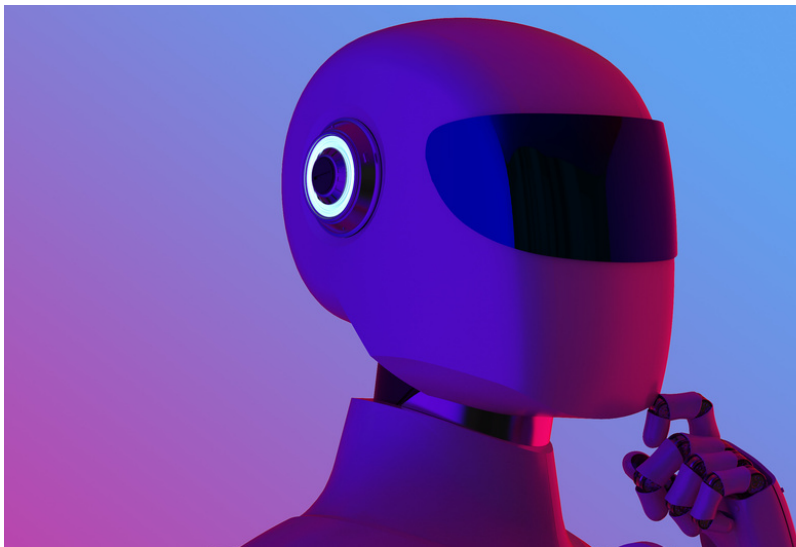


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AI researchers are unable to make any significant advancements in practical domains. In order to find the right pathways in this field, large and particular cross-disciplinary cooperation are required. This will assist in creating a unified scientific methodology for using and navigating AI amid society's most pressing requirements. Over the next 10 years, AGI development will pick up speed. By 2030, there is a 25% probability, according to experts, that AI will resemble humans. The development of robotic methods and machine algorithms, as well as current data expansion and technical improvements, will provide a strong basis for human-level AI systems.

– Riya Tyagi



# Geospatial Technologies

*"Ok Google, show me food outlets nearby"* and you get places to spend your time away but have you ever been reminded back and thought about how Google was able to plan your perfect place?

Well, Geospatial Technology has a lot of potential. Geospatial tech came into awareness through Google Maps but it has been pretty much around since the evolution of the internet, though was not that readily available. Currently free of cost, it is one of the most reliable adaptations in today's challenging world. In terms of scientific explanations, it is spatial data that allows us to determine the exact location of a person or object on the face of the planet Earth. It correlates an object's position with geographical coordinates.

However, commonly known as GPS and considered as a chip inside your phone, it is much more than that.

Geospatial tech inscribes three interrelated technologies with it:

- Remote sensing
- Global Positioning System
- Geographical Information Systems

## Remote sensing

There are many elucidations as to how remote sensing culminates in geotagging. It studies objects or surfaces at remote distances and senses them with active or passive systems, experts then assess these responses and make conclusions. It collects data through reflective properties of:

- Electromagnetic impulses (frequency waves such as visible light, infrared, and radio waves)
- Filmed or digital aerial imagery (through drones and aeroplanes)
- Radars and Lidars (to calculate distances with radio and light signals)

## GPS

It is based on the geometric phenomenon of triangulation, conferring it to layman's terms it works using three sources. Hence, triangulation.



On the Occasion of the 1st Anniversary of the Release of Geospatial Data, the Government said that geospatial technology along with drones will survey all the over 6 lakh Indian villages under the SVAMITVA scheme.



Trilateration is a way of locating a point based on how far away it is from three other points. Multiple satellites must connect with the receiver to use this process. In trilateration, distances between the targeted object from several ever-revolving satellites are calculated and the object's location is then inferred. Trilateration is similar to triangulation, which measures angles in a likewise manner. With recent advancements it has been further upgraded to make use of four sources, the results being improved and accurate.

## GIS

It is that part of the process where the magic happens as it merges spatial and nonspatial data, remote sensing imagery, and GPS data points to elaborate a single complete system.

It allows users to collect, group and analyse required information on multiple layers, including elevation, vegetation, forest health, road, and henceforth.

Geospatial technology and its overlapping benefits with other industries:

- Geospatial technology is used in Logistics, Forestry and Timber, Health, and Human Services.
- Using geospatial data, environment conditions monitoring, afforestation, available resources, and factors like weather phenomena are watched out for. The health community uses this to provide ambulance assistance by collaborating with location-based intelligence, geotagging the spread of viruses, and incorporating health services area-wise.
- It can help in managing and efficiently coming around from calamities.

How is geospatial technology revitalising existing applications of technology?

- Through remote sensing and the use of miniature sensors and drones, geospatial technology is helping to collect data that the human eye cannot reach.
- With the next-gen self-driving cars soon entering our realities, geospatial technology will form crucial grounds in automation.
- Many companies have their business ideas laid on the reliant features of this technology. Companies such as Uber, Zomato, and Tata 1 mg can attract customers due to features like GPS and GIS

There has been a word for geospatial technology to be a separate field of study and degree courses to be introduced. The degree would require a solid understanding of geographical concepts, topology, and some system software like ArcGIS, and AutoCAD. The advancements in this technology have helped humans save a lot of time and “labour too.”

– Vanshita Jain

# ROBOTIC PROCESS AUTOMATION

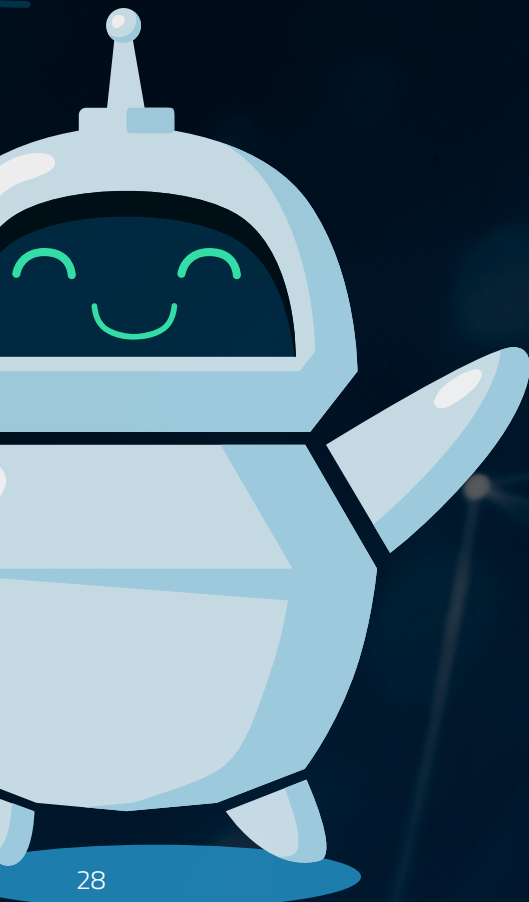
Robotic Process Automation (RPA) is a software technology that makes it easy to build, utilise and manage software robots that emulate human actions interacting with digital systems and software. RPA aims to reduce error rates, increase productivity, decrease labour costs and increase customer satisfaction. Applications for RPA give users the means to create robots that can mimic human interactions with software by processing transactions, manipulating data, evoking reactions, and interacting with other digital systems. By 2025, automation technologies like RPA are expected to potentially have a \$6.7 trillion economic effect, according to a recent estimate.

## **How RPA combines automation and AI**

“RPA, which is a synonym for AI, is the use of technology that enables staff members in an organisation to programme computer software or a "robot" to reason, gather and extract knowledge, recognise patterns, learn from experience, and adapt to new circumstances.”

The first question that arises about Robotic Process Automation is where and when it is applicable. RPA is used in banking and financial services (especially RPA + AI is used in banking), in healthcare, public sector, etc. Telecommunication companies use RPA to configure new services and the associated billing systems for new accounts. All the major systems integrators like Deloitte, EY, Wipro, and Tata Consultancy Services, are using RPA to help build applications that can make it easier for companies to adopt best practices.

The best-suited processes for RPA have high transaction volume, a high level of standardisation, well-defined implicit logic, and high maturity. Automating high volume and repetitive tasks can bring high savings in





working time, while maturity secures the automated processes' presence in the environment.

### **Required skills**

RPA developers do not require programming skills but should possess knowledge about business processes. RPA developers should have not only business management skills but should also know data analytics and RPA platform skills. Developers should also know about debugging, testing and updating robots because sometimes bots don't work as planned. So for the debugging and testing phase, an RPA developer should have high problem solving skills to find bugs.

While RPA has advantages, it also has its dark sides. Like potential jobs, fewer means if a robot can work faster with a more consistent rate, then it is assumed that there will be no need for human input. Also, RPA requires initial investment costs and it is not easy for organisations to decide whether they should invest or not in Robotic Automation. Also for RPA, organisations have to hire skilled staff and by RPA only those tasks can be done which are repetitive, rules-based and do not require human judgement. So there are only limited tasks that you can automate with RPA.

RPA holds immense potential in reducing errors and enhancing efficiency, making it crucial for establishing an optimal operational setting. Repetitive tasks can be completed rapidly and efficiently, freeing humans from such responsibilities. This, in turn, allows them to concentrate on tasks requiring reasoning, problem-solving skills, and judgement. However, implementing an RPA solution may encounter resistance and obstacles along the way.

- Nikita

# Events 2022-23

## 1. INFUSION '22 The Official Freshers' Party



Ordinateur organised INFUSION '22, the Annual Freshers' Party on 26th November 2022. The event aimed to welcome the newcomers and commenced with warm greetings in the Auditorium. The program featured an ambitious opening speech and showcased various talents, including ramp walks, poetry, dancing, and singing by both juniors and seniors. Engaging games added excitement to the event, with the audience actively encouraging the participants. Mr. and Ms. Freshers were crowned even though it was a challenging task due to the remarkable performances by everyone. The program concluded with lively dancing, creating another beautiful memory to cherish.

2.

## Seminar on Open Source



On 20th January, 2023, a seminar on Open-Source was organised by Ordinateur. The seminar was led by Bhavna Chauhan, Founder of SheBuilds Hacker Community, Software Developer, Mentor and Freelancer. She started off with a brilliant speech and an introduction to Open Source which kept all the listeners spell bound for more than an hour. The excitement and the inquisitive response from the audience made it even more interactive. The seminar helped tech enthusiasts to expand their spectrum of knowledge about Open Source and other programming fields. All the attendees got to know about many new emerging fields to build their career on. Various doubts raised by the students were cleared by our speaker in a concise manner. The seminar was concluded with a vote of thanks by Ms. Aarti Goel to the speaker for such an informative seminar session.



3.

## PRE-PLACEMENT TALK



On 24th February, 2023, a Pre-Placement Talk organised by Ordinateur and conducted by final year students of the Computer Science Department was an informative and captivating event particularly aimed at the 2nd year students. The presentation was conducted by Sarthak Prakash, Ex-President, and Kartikeya Chaturvedi, Ex-General Secretary of Ordinateur. The speakers enlightened the audience about the various nuances involved in the process of placement, and how one can improve their profiles and skills to better themselves. The audience had a lot of queries, which were promptly solved by the presenters. The session went on for more than an hour and had a positive impact on the students. The speakers assured the audience that by focusing on their curriculum, they could conquer many obstacles about the concepts.

4.

## TALAASH A Treasure Hunt Event



Ordinateur successfully organised a Treasure Hunt event named Talaash on 8th April, 2023. The event saw more than 190 teams take part in the online round and 15 teams taking part in the offline round, each with an average of 3 members. The event was conducted on the college premises, and the teams were given clues to get on with the treasure hunt. The participants were given instructions before the event began, explaining the rules and regulations. The event organisers ensured enough staff were present to check the event and aid the teams if needed. The event was designed to promote problem-solving skills, teamwork, and quick thinking. The teams enjoyed the event and showed their skills in a fun and engaging manner. The winners were awarded cash prizes and goodies, making the event even more exciting. Overall, Talaash was an excellent event, and the participants looked forward to more such events in the future.

5.

## Seminar on Dental Hygiene



Dr. Pooja's Dental Health and Implant Center, in association with Ordinateur, organised a dental seminar on 24th April, 2023. The seminar aimed to educate students about the advancements and achievements in dental operations. The seminar was led by Dr. Pooja delivered a comprehensive session on maintaining healthy teeth and gums. She discussed common dental issues faced by students and provided practical tips for oral hygiene practices, including brushing techniques, flossing, and the importance of regular dental check-ups. The speakers emphasised the correlation between oral health and overall well-being, highlighting the role of diet and lifestyle choices in preventing dental problems. Overall, the seminar served as a platform for students to expand their knowledge of oral health and foster a deeper understanding of dental care practices.

6.

## AU REVOIR '23

Farewell for the Batch of 2023

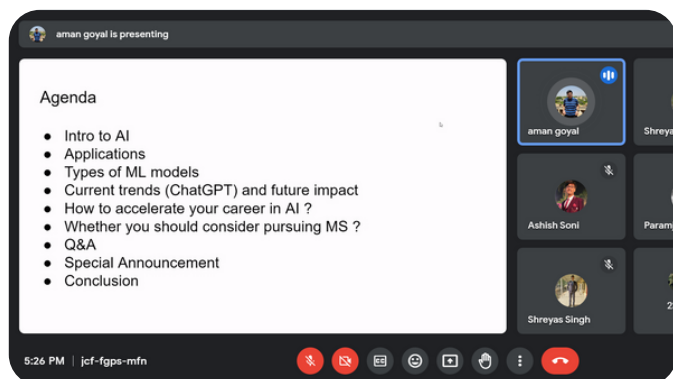


On May 18, 2023, Ordinateur organized the farewell event, AU-REVOIR '23, for the Batch of 2023 at the College Auditorium. It was a joyous and bittersweet occasion to bid farewell to the departing students and commemorate their time at the college. The event was an occasion to express gratitude for their contributions, celebrate their achievements, and provide closure to their college journey. The highlights included entertaining performances by the students, a fun game for the seniors, stunning ramp walks, and dance performances by both freshers and seniors. The farewell party ended with everyone swaying to the music played by the DJ, capturing the happiness and nostalgia of the event.



## 7.

## Webinar on Machine Learning



Ordinateur, on 20th June, 2023, hosted a webinar on machine learning, featuring Aman Goyal, an AI research engineer at Intel. Aman's presentation provided an overview of machine learning basics, career opportunities in AI, current trends, and future studies. He introduced supervised, unsupervised, and reinforcement learning, showcasing real-world applications and their impact on industries. He emphasized the rising demand for AI professionals and diverse career paths in the field, offering practical advice for success. He also discussed emerging technologies such as deep learning, natural language processing, and computer vision as current trends in machine learning. In conclusion, the webinar encouraged attendees to pursue advanced studies and foster innovation in addressing real-world challenges, leaving them equipped with valuable knowledge for their growth in AI.

## 8.

## Hack 7 Day Hackathon



Ordinateur collaborated with Tezos India to organize the Hack 7 Day Hackathon, a week-long event focused on Web3 development. The event commenced on 22nd June 2023 with an offline workshop, conducted by Simarpreet. The workshop covered essential topics such as an introduction to blockchain, its history, use cases, and applications, as well as an overview of Tezos and its distinguishing features. The following day, 23rd June, an offline workshop was conducted, introducing participants to Smartpy and guiding them on building smart contracts on the Tezos platform using Smartpy. On 24th, an online workshop took place, where participants learned about building the frontend of decentralized applications and integrating them with Taquito.js. The subsequent three days, 25th to 27th, were dedicated to providing participants with time for building their projects. Finally, on 28th June, the hackathon culminated in a 12-hour offline event held at Hansraj College.

# FACULTY MEMBERS



**MR. SANJAY BATRA**

ASSOCIATE PROFESSOR  
M.C.A.



**DR. HARMEET KAUR**

ASSOCIATE PROFESSOR  
M.C.A. | Ph.D.



**DR. BALJEET KAUR**

PROFESSOR  
M.C.A. | Ph.D.



**DR. MANOJ AGARWAL**

ASSOCIATE PROFESSOR  
M.C.A. | Ph.D.



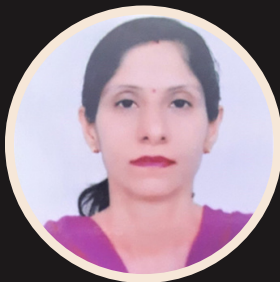
**DR. SUNITA CHAND**

ASSISTANT PROFESSOR  
M.C.A. | M.Phil  
M.Tech | Ph.D.



**MS. ALKA KHURANA**

ASSISTANT PROFESSOR  
M.C.A. | Pursuing Ph.D



**DR. MANJU**

ASSISTANT PROFESSOR  
M.Sc | M.Tech | Ph.D.



**MS. AARTI GOEL**

ASSISTANT PROFESSOR  
M.C.A. | M.Phil  
Pursuing Ph.D.



**MR. SUYASH KUMAR**

ASSISTANT PROFESSOR  
M.Tech | Pursuing Ph.D.



**DR. VIDHI KHANDUJA**

ASSISTANT PROFESSOR  
M.Tech | Ph.D.



# BITWISE TEAM



**Aasim Mohammed**  
Editor-in-Chief



**Akansha Bharti**  
Coordinator



**Muhammed Husnain**  
Copy Editor



**Ankit Raj**  
Designer



**Arun Chandra**  
Designer



**Arun Krishna**  
Designer



**Nitin Dhiman**  
Designer



**Sophany Phoeun**  
Designer



**Subhajit Das**  
Designer

(2022-2023)

# ORDINATEUR

The Computer Science Society  
Hansraj College