

# Shell Newsletter

Department of  
Computer Science & Engineering



Volume 6

Issue 2

June 2021

## Vision and Mission of the Institute

### Vision

- To be one of the premier institutes of Engineering and Management Education in the country

### Mission

- To provide Engineering and Management Education that meets the needs of human resources in the country
- To develop leadership qualities, team spirit and concern for the environment in students

### Objectives

- To achieve educational goals as stated in the vision through the mission statements which depicts the distinctive characteristics of the Institution
- To make the teaching-learning process an enjoyable pursuit for the students and teachers

## Vision and Mission of the Department

### Vision

- To be a premier department for education in Computer Science and Engineering in the state of Karnataka, molding students into professional engineers

### Mission

- To provide teaching/ learning facilities in Computer Science and Engineering better than prescribed by University for easy adaptation to industry and higher learning
- Provide a platform for self-learning to meet the challenges of changing technology and inculcate team spirit and leadership qualities to succeed in a professional career
- Comprehend the societal needs and environmental concerns in the field of Computer Science

## Dedicated to



*Margaret Hamilton, a computer pioneer played an important role in landing astronauts on the moon for the first time on July 20, 1969 and returning them safely a few days later. Hamilton, who popularized the term 'Software Engineering', took some criticism for it. Critics said it inflated her work's importance. Hamilton was an American computer scientist, systems engineer, and business woman who contributed to development of software engineering and was a role model for other women to contribute to the Apollo program. Hamilton's work guided Apollo missions, that landed on the moon as well as benefitting Skylab, the first US space station, in the 1970s.*

## Inside Shell

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Vidyayāmruthamashnute

# B. N. M. Institute of Technology

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## From Editor's Desk

Dear Reader,

“There are no great people in this world, only great challenges that ordinary people rise to meet!”

This is how life should be approached at, this has been the sole reason for evolution of the human society to the lanes of the latest innovations and technological advancements happening around the world. I feel privileged in presenting to you the newsletter of our Computer Science and Engineering Department 'SHELL' Volume 6 Issue 2.

As I write this, I am delighted to see the enthusiasm in my fellow college mates in contributing towards this issue. It is evident that even in this challenging virtual life we live in, our thirst for knowledge and desire to share has led us all down a common path. It has made possible for this melange of articles, blogs and a plethora of information.

This newsletter is our attempt to encapsulate the recent technological highs and lows, created by a budding group of aspiring engineers. I would like to take this opportunity to thank our Department of CSE on behalf of my team. I thank the tireless endeavours set forth by the team in making this newsletter a success. I invite you to immerse yourself into the unfolding dialect of Science and Technology.

**Shreyas K**  
**IV CSE 'B'**

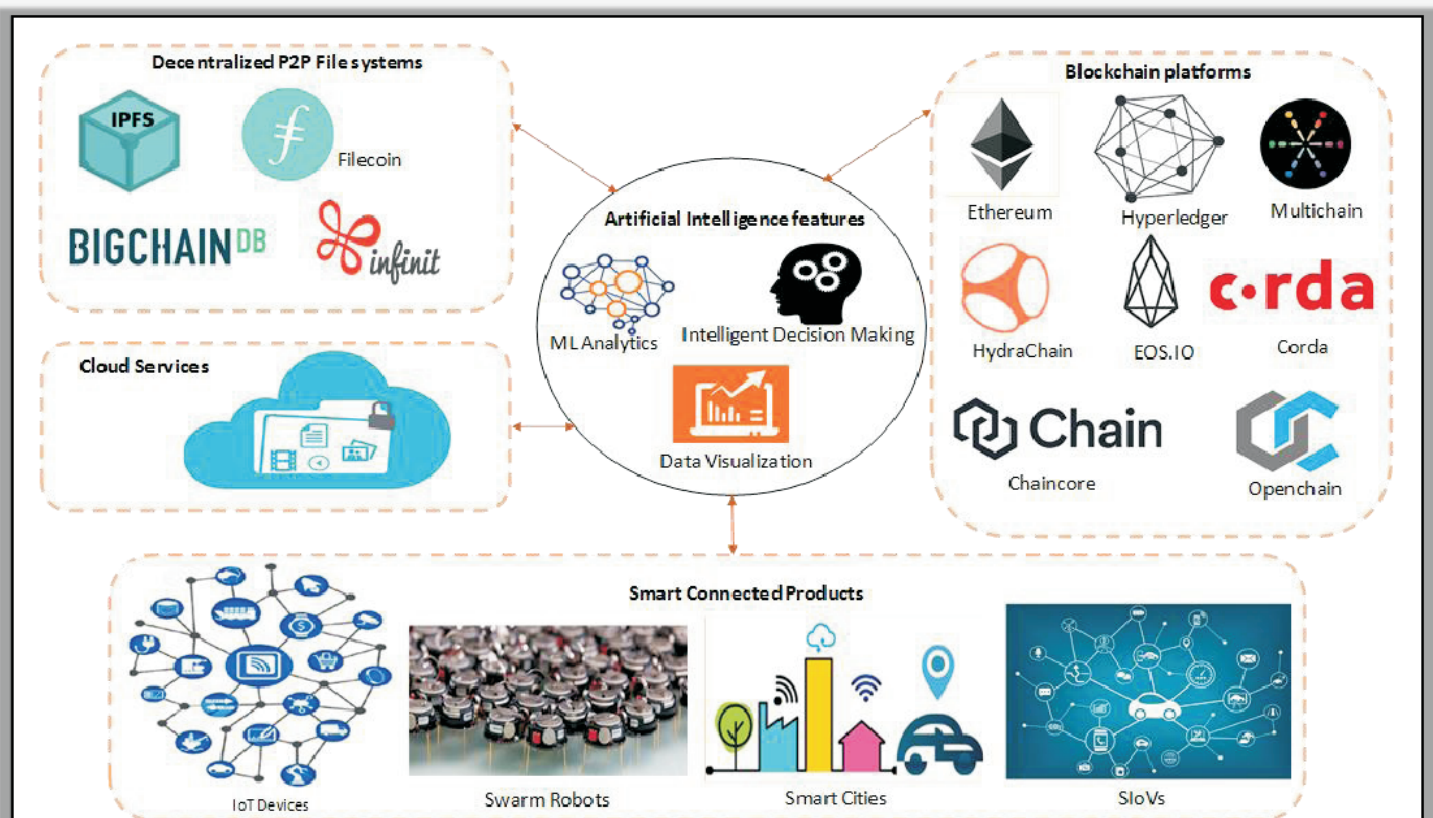
## Department Profile

The Department of Computer Science & Engineering started in 2001 with an intake of 60 students and the present intake is 120. Presently the department is headed by Dr. Sahana D. Gowda. The Department is renowned for imparting quality education with well-qualified and dedicated faculty members, who are experts in various domains of Computer Science & Engineering and strive for an exceptional career growth for the students.

The Department offers undergraduate and postgraduate programmes in Computer Science & Engineering. A well-equipped Research & Development (R&D) Center, affiliated to VTU, has been set up to cater to the needs of the research scholars, as they conduct cutting-edge research towards doctoral degrees.

The Teaching-learning process put in place by the Department is well-defined to help students explore the trending technologies via Skill Development Programmes organised by the Industry-Institute Interaction Cell. Students are also encouraged to improve their performances in the university examinations through Performance Enhancement Classes. The Innovative Project Labs (IPL) of the R&D Center encourages and equips the faculty and students to uncover innovative ideas, which are also funded through the Innovation & Entrepreneurship Development Cell (IEDC) to ensure prototyping to validate the ideas.

**Dr. Sahana D. Gowda**  
Professor & Head of the Dept. of CSE





## Blockchain

Ever wondered if there's an easier way to complete transactions without having to deal with Online wallets, Banks and Third party applications? Well, it is possible by Blockchain. Blockchain is a decentralized, ledger of transaction that is duplicated and distributed across entire network. There are many ways a bank transaction could fail. It could be due to technical issues at the bank, one of their accounts being hacked, or daily transfer limits being exceeded or some additional charges like high transfer charges associated with transferring money. To solve these problems, the concept of Cryptocurrency came into existence.

Cryptocurrencies are a form of digital or virtual currency that run on a technology known as Blockchain. Cryptocurrencies are immune to counterfeiting. It does not require a central authority and it is protected by strong and complex encryption algorithms. In a market of more than thousands of cryptocurrencies, 'Bitcoin' is one of the best. If a group of people are transferring Bitcoins, the transaction details between them is permanently inscribed in a Block. This record also holds the number of Bitcoins that each member in the group own. These individual blocks are linked to each other as each of them takes reference from the previous one for the number of Bitcoins each member owns. This chain of Records or Blocks is called a Ledger and this Ledger is shared among all the members of that group which acts as a public distributed Ledger. This forms the basis of Blockchain. So, if one of them has insufficient Bitcoins and tries to transfer more than what is left, the transaction will fail. This is because all the members have copies of the Ledger and it's clear that the person has insufficient Bitcoins left to transfer. They will flag this transaction as Invalid. A Hacker will not be able to alter the data in the Blockchain because each user has a copy of the Ledger and the data within the blocks are encrypted by complex algorithms.

Blockchain can be described as a collection of records linked with each other which are strongly resistant to alteration and protected using cryptography. Every user in the Bitcoin network has two keys namely, Public key and Private key. Public key is the address that everyone in the network knows like Email address, whereas Private key is a unique address that only the user knows like Password. First the Sender passes the number of Bitcoins he/she wants to send to the receiver along with their unique wallet address through a Hashing algorithm. All of this is part of the transaction details. These details are encrypted using encryption algorithms and using Sender's unique private key. This is done to digitally sign the transaction and to indicate that the transactions came from particular Sender. This output is now transmitted across the world using Receiver's public key. With this, the message or transaction can be decrypted only by Receiver's private key which only the receiver knows. Different Cryptocurrencies use different hashing algorithms. Bitcoin uses the SHA256 algorithm. Ethereum uses Ethash.

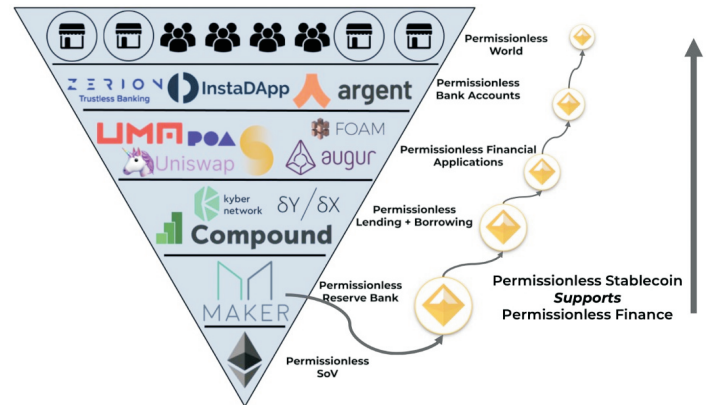
These transactions are taking place all around the world which are first validated and then added block by block. The people who validate these blocks are called as Miners. For a block to be validated and added to a Blockchain, miners need to solve a complex mathematical problem. The miner who solves this first adds the block to Blockchain and is rewarded with 12.5 Bitcoins. The process of solving the complex mathematical problem is called Proof of work and the process of adding a block to the Blockchain is called Mining. With this, the

Sender's and Receiver's wallets are updated just like every person in the network who has completed a transaction.

Blockchain is used to share medical data securely, Real-time IoT operating systems, Personal Identity security, Supply chain and logistics monitoring.

**Nagashree M S**  
**VI CSE 'B'**

## Bullish Case of Ethereum



In the future Ethereum would be the most commonly used currency. It was started as a dream, as a successor of Bitcoin but now it's showcasing a whole new pathway of decentralization. In this article, we will be concentrating on the tech stack of Ethereum and what it has in its arsenal, and why everyone is bullish on ETH.

Initially it was observed that Bitcoin was not specifically solving the problems of blockchain, in other words bitcoin developers were not approaching in a right way. In the attempt of renaissance of blockchain, Vitalik Buterin and Co-Developers created Ethereum. Ethereum works on Layer 1 currently, Layer 1 is the underlying blockchain architecture, which is able to run consensus mechanism like Proof of Work, which enables faster transaction than bitcoin. But the drawback here is that the chain becomes too crowded.

But Ethereum developers or as they like to call themselves ETH community have come up with a solution that is building a Layer 2 called ETHEREUM 2.0 which acts as an overlay bridge of a network that lies on the top of blockchain. Ethereum 2.0 uses Proof of Stake (PoS) as consensus mechanism, where an individual has to stake ETH to become any kind of validator. This consensus mechanism eliminates the probability of causing harm to the network from a malicious attacker.

Ethereum uses Smart Contract. Smart Contracts are nothing but computer programs. These computer programs act as middle men for all the transactions on the chain. These programs check for certain conditions during a transaction. If the conditions are met, the locked funds are moved and the transaction is completed.

In the next 5 years, Web 3.0 and Ethereum 2.0 would be mainstream, and all the transactions would be decentralized. As it is famously said in the blockchain community, Betting on Ethereum is like Betting on Technology!

**Govardhan Biradar**  
**VIII CSE 'A'**



## ***IoT - A revolutionary approach for future technology enhancement***

Internet of Things (IoT) has brought in a paradigm shift in the life style of people from a traditional one to that of a high-tech one. IoT has enabled transformations like Smart city, smart homes, pollution control, energy saving, smart transportation, smart industries. IoT is evolving to become an integral part of our lives. Extensive research is being done in this area and many such scientific articles, press reports are available on the Web. Many use cases are generated and are being tested predominantly in the 5G eco system, which is seen as a primary driver for application development in 5G networks. One such use case of IoT is the concept of Smart Home Systems (SHS) and appliances that consist of internet-based devices, automation system for homes and reliable energy management system. IoT has brought up some new advancements to make it more efficient, comfortable and reliable. Intelligent sensors, drone devices are now controlling the traffic at different signalized intersections across major cities.



Khajenasiri et al, performed a survey on the IoT solutions for smart energy control to benefit the smart city applications. They stated that at present IoT has been deployed in very few application areas to serve the technology and people. The smart home business economy is about to cross 100 billion dollars by 2022. Smart home does not only provide the in-house comfort but also benefits the house owner in cost cutting in several aspects.

The world's growing population is estimated to reach approximately 10 billion by 2050. Agriculture plays an important role in our lives. Greenhouse technology is one of the possible approaches in this direction. With the advancement of IoT, smart devices and sensors makes it easier to control the climate inside the chamber and monitor the process which results in energy saving and improved production. With the extensive growth and expansion of IoT network, the number of these sensors and devices are increasing rapidly. These devices communicate with each other and transfer a massive amount of data over internet. IoT big data framework for smart buildings is very useful to deal with several issues of smart buildings such as managing oxygen level. This large amount of information needs to be integrated in one database and processed in real time to take quick decision with high accuracy, for which Big Data technology is the best solution.

**Keerthi Hali**  
**VI CSE 'A'**

## ***Robotic Process Automation***

Robotic Process Automation (RPA) is a technology that mimics the way humans interact with the software to perform bulky reparative tasks. RPA technology creates bots or software programs that can complete the required tasks. A bot works from the user's interface, mimicking human actions such as filling forms, dialing a number, and opening various documents. Some advanced robots can even perform cognitive processes like interpreting the text, engaging in chats and conversations, and applying advanced machine learning models to make complex decisions.

Although robots act like humans, their speed, accuracy, and efficiency are far greater than humans. It is also very easy and quick to deploy integrations and automated solutions, making RPA ideal for a rapidly changing business environment.

One of the immediate benefits of RPA is its ability to integrate systems where gaps existed. Enterprises that do not have enough resources and depend on third-party sites can easily deploy their bot to bridge the gap.

Today, AI and RPA are the two most successful but different technologies to achieve our incompatible goals. On one hand, AI simulates human intelligence which includes learning, reasoning, and self-correction and on the other, RPA works by automating repetitive straightforward tasks without learning from one repetition. The combination of RPA and AI is known as Intelligent Automation (IA) that expands the horizon of business process automation and transformation by using the features of both the bombing technologies.

It's no wonder that Robotic Process Automation (RPA) is rewriting the story of work. It will soon spread its roots all over the industries to automate repetitive tasks and do lower-value work so that humans can focus on the things they do best and enjoy more.

**Vidhi Sinha**  
**IV CSE 'B'**

## ***AWS Insights in Formula 1***

Formula One (or F1) has been one of the premier forms of auto racing around the world since its inaugural season in 1950. Formula One is not just a battle between the world's best drivers, but also a battle between some of the world's most innovative engineers. No other sport has been as dynamic in its evolution and embracing of new technology. Formula One cars are the fastest regulated road-course racing cars in the world, owing to very high cornering speeds achieved through the generation of large amounts of aerodynamic downforce. A Formula One race takes place in the course of a weekend. Fridays are for practice sessions, where the drivers work with their teams to find the right setting on the car. Saturdays are reserved for the qualifying session, which determines what order the drivers will start the race in. The order is decided by the lap times of each driver, the fastest man being the first. The Sundays are of course, the race days!

### **F1 INSIGHTS POWERED BY AWS**

AWS is a cloud platform providing cloud infrastructure to various organizations and is currently the market leader in





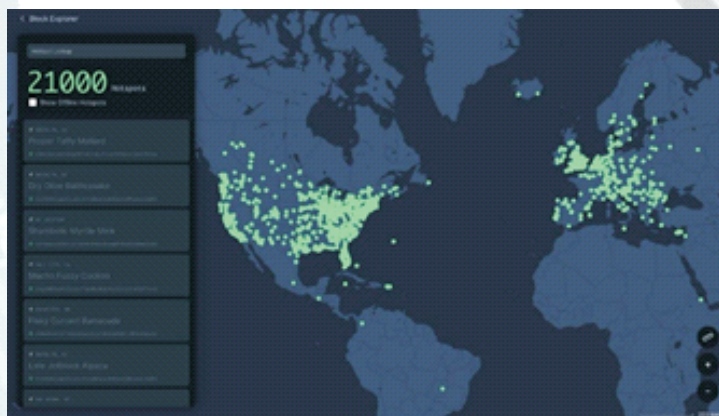


to see in person. One can travel to the interior body, space, chemical structures, the deep sea, buildings, the sky, planets, or whatever else one can imagine. Thus, virtual reality can be simply classified as one of those scientific discoveries with a high degree of elasticity, and with ongoing study in this sector, we may expect even greater results that will bring significant improvements to nearly every field that uses computer technology.

**Nidhi Srivastava**  
IV CSE 'B'

## *The future of Helium Blockchain and its possible*

Every day we connect to our Wi-Fi for content like watching videos on YouTube or browsing on social media. Every day we connect to the internet, it's not just us, many other devices such as smart sensors, security cams, and many of our appliances. These devices make up the internet of things.



It is expected that in the next five years, 75 billion devices or things will need some way in which we can wirelessly connect to the internet. Right now, connecting these things to the internet is tricky; it's either too expensive to afford cellular data plans or too power prohibitive. This is where Helium steps in.

### **What is Helium?**

Helium is a global, distributed network of Hotspots that create public, long-range wireless coverage for LoRaWAN-enabled IoT devices. These hotspots are connected to the secure Helium blockchain, which provides access to the largest LoRaWAN Network in the world. The best part is that it can be built and owned by you, making it the people's network.

Unlike other networks, the people's network paves the way to build wireless networks of the future by putting ownership in your hands while improving coverage and affordability for a new class of devices.

### **What makes the Helium Blockchain special?**

The Helium Blockchain is a new blockchain built from the ground up to incentivize the creation of decentralized, public wireless networks. It uses its own novel work algorithm called Proof of Coverage, and rewards miners in \$HNT, the native token of the Helium blockchain. This means that you can get your own helium hotspot and use it to mine \$HNT by simply helping build the network and participating in proof of coverage. The more the data transferred, the larger is the reward.

The Proof of Coverage (POC) algorithm autonomously verifies whether all hotspots are real and located where they say they are. To send data over the network, devices must use



data credits (another token used by the hotspots and fixed in value). Data credits are created by burning \$HNT, reducing the total supply to achieve a burn and mint equilibrium.

### **How is it futuristic?**

Thanks to this unique incentive model, we can finally get affordable and ubiquitous connectivity for IoT devices, ranging from electric cars and pet tracking to climate sensing and crucial healthcare monitoring solutions. A new class of devices finally have a way to connect over long ranges. Batteries can last years between charges, and costs are a magnitude cheaper than other cellular alternatives.

These are just a few applications of Helium, and it is being used immensely in many fields and is also set to expand exponentially in the future.

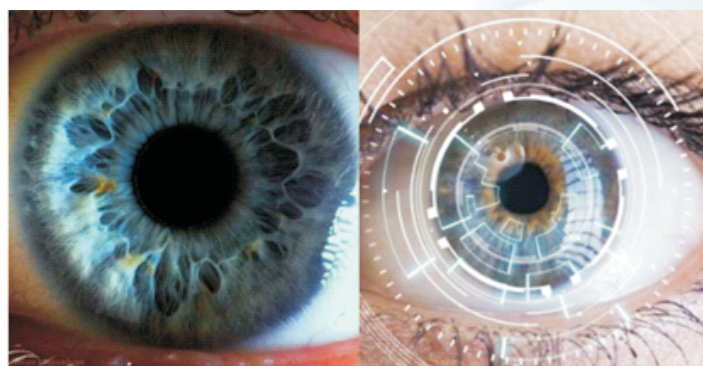
**Yash Aryan Chopra**  
VI CSE 'B'

## *Iris Recognition*

Biometrics is a way to measure a person's physical characteristics to verify their identity. Iris recognition is a type of biometric technology, to identify people based on unique patterns within the ring-shaped region surrounding the pupil of the eye. It is the process of using visible and near-infrared light to take a high-contrast photograph of a person's iris. It measures the unique patterns in irises, the coloured circles in people's eyes.

### **HOW IRIS RECOGNITION WORKS???**

Iris recognition is done by Iris Scanners. Iris scanner is a biometric device utilized for a real-time identification

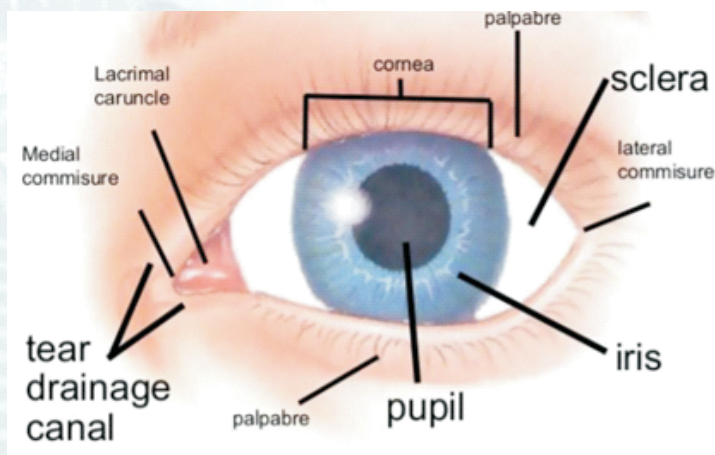


process with higher performance and greater accuracy. Iris scanners exclude eyelashes, eyelids, and selects only the parts of the iris. It extracts the eye line pattern and colours. It collects around 240 biometric features. This combination results in a set of pixels that are unique to every eye. The scanners then create a digital representation of that data and form the encoded bit pattern. This encoded bit gives the information of the iris and is stored in a computer database. Later iris is compared with the stored templates in a database for verification. Since the iris is different between the left and right eye, recognition can be performed separately for each eye. It is also possible to distinguish twins by this technique.



## STEPS

1. A camera scans the person's eye and then produces a digital image.
2. Image processing software attempts to isolate the iris by drawing two circles, one at its inner boundary (between the pupil and iris) and another one at its outer boundary (between the iris and the sclera). The inner boundary is easy to detect because it's a circle which gives away to the iris with a sudden change in the brightness of the pupil. A similar process is done to the outer boundary also.
3. Concentric circles and radial lines are then added to the image to define separate "zones of analysis". Hence the key features of the iris are accurately located. It also allows the way in change of iris as pupil increases and decreases in size at different light conditions.
4. The pattern of light and dark areas of the iris is then converted into digital form by bandpass filters. Area with more brightness is registered as 1 by bandpass filters. Otherwise, it registers as 0. Then it creates a digital IRISCODE. Dilution of the pupil will not affect this digital code.



## WHAT MAKES AN IRIS SCAN UNIQUE???

The iris is the coloured ring of muscle. The coloured pattern is determined genetically when we are in the womb. But it is not fully formed until the age of 2. It comes from the pigment called melanin. More melanin gives browner eyes and less melanin produces bluer eyes. Even though we talk about blue eyes, brown eyes, green eyes, the colour, and the pattern is extremely complex and unique. All these together make an iris recognition unique.

### Advantages

- **Difficult to spoof:** - It is difficult to spoof or forge as it is an internal, non-touchable body part. Hence Iris recognition proves safer.
- **Stable:** - Fingerprint impression of a person fades with age and time. Often sweaty and dirty fingerprints are hard to capture. But Iris recognition is easy and remains stable.
- **Contactless and Hygienic:** - Iris recognition provides a contactless solution without touching the device. This makes it more hygienic to use.
- **Fast Matching, Unchangeable and Accurate**

### Applications

**National ID:** - Every nation including developing countries provides a National ID to citizens. For more accurate identification, iris recognition is also initialized to prevent duplicate registration.

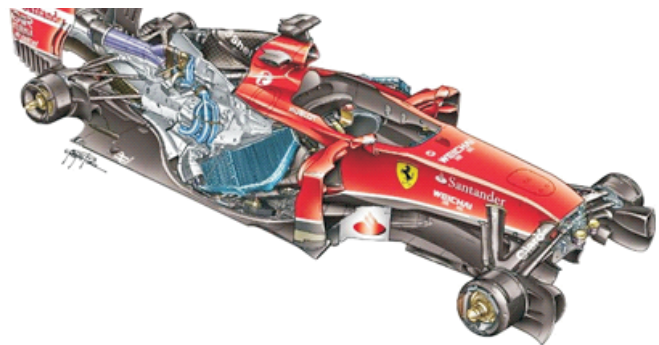
**Immigration security and Boarding Security:** - To modernize the security measures, international borders are maintaining Iris biometric authentication to smoothen the immigration process for safety measures.

**Banking services, Healthcare sectors, Attendance management and Credit card Authentication.**

**Srilakshmi N**  
**VI CSE 'B'**

## Formula One - Behind the scenes

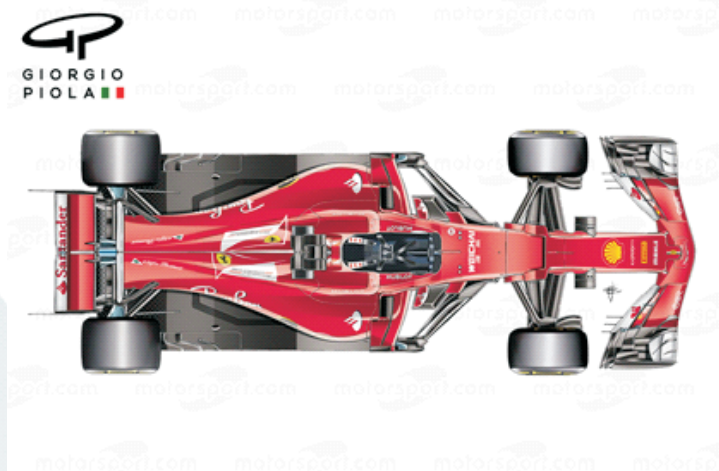
Formula One is the pinnacle of motorsport, with the fastest racing cars in the world which are engineered to their limits. Formula One or F1, as it is popularly known, is held all around the world, and happens on the weekends. The F1 race or Grand Prix is held in various locations, such as Monaco which



is marked by its glitz and glamour and in locations that are steeped with histories such as Silverstone and various other exotic locations such as Singapore, Dubai. It is followed by millions of fans who watch it through television and more passionate fans visit the circuit, to support their favourite teams and drivers, while others come to feel and experience the unforgettable roars and speeds of the F1 cars. The drivers or racers in this are "the best of best" and the competition is cutthroat with no room for errors, where they either sink or swim, as mistakes are not easily forgotten. In Formula One, to succeed one must primarily have good skill and a good team, to win the races. But on top of this, they must have a good strategy for every race. They must factor in everything to make a good race plan from pit stops, tyre management, fuel intake, and suspension setups are a few examples. Each team creates its unique race strategy to utilize its strengths and to counter their rivals. The teams engineer their cars to the limits and try to exploit, any loopholes present in the rules and regulations, as every thousandth of a second matters here.

To clamp down on the violations, it is the responsibility of the FIA, Federation Internationale de l'Automobile, which is the governing body of Formula One. They are tasked with creating the rules and regulations to control the direction in which the Sport is heading. At the moment they are pushing for cleaner and more efficient cars with hybrid technology and biofuels. Each Grand Prix is held mostly in Racing Circuits, but can also be held across public streets, for





example, Singapore, Baku, Monaco. At the moment there are ten teams and twenty drivers, two drivers each a team, who compete for the top step of the podium. The drivers compete for the World Drivers Championship while the teams compete for the Constructors' title.

Each position carries a different number of points, which decides the prize money that each team receives.

The Formula One motorsport has a rich history and is at the forefront of human technology, as it ever so pushes the boundaries every day. From its incredible logistics for getting around the world to the precision of its aerodynamics, it pushes technology in every sector. Hence Formula One can be said to be more than a just sport, as it touches every branch of science to gain even an iota of an advantage.

**Manish K Reddy**  
IV CSE 'A'

## *Scope of Virtual Reality*

Virtual reality is one of the trending technologies because of its ability to provide the users with a real-life experience at a fraction of cost. Virtual reality is a simulation where a person interacts with the environment using various devices like a VR headset, special goggles with a screen or gloves consisting of sensors. It enables users to experience a 3D environment. Google, Unity, Microsoft, Samsung and Oculus VR are some of the world's largest virtual reality companies.

### **Virtual Reality and Artificial Intelligence:**

Virtual reality when combined with Artificial Intelligence can do miracles in different fields of applications like medicine and this gives an improved user experience. Virtual Reality uses technology for creating simulated environments for users while Artificial Intelligence aims to outfit technological devices with the keen insight and perception of a responsive being. For example, shopping experience can be enhanced with the help of Virtual Reality. People who are interested to buy furniture online can use VR to test if the product will actually fit in their living space with the original dimensions properly mentioned on the site. Artificial Intelligence can further improve the experience by recommending products based on the search engines and the products previously purchased, if any. Hence Virtual reality and artificial intelligence are something that should go hand in hand.

Future Scope of Virtual reality and its applications:

With the recent gush in VR compatible smartphones, VR is quickly spreading as a familiar name. There are already

several applications of VR in the market. In total, the value of the market for VR business equipment is forecast to grow from \$829 million in 2018 to \$4.26 billion by 2023, according to research by Artillery Intelligence.

There are various fields in which Virtual Reality can be applied. It can be used in gaming, for business purpose, in medical field, fashion technology, education, sports and what not. Hence, it does no harm in saying that VR based products are going to have one of the greatest impacts in the field of technology.

**Mahima R**  
VI CSE 'A'

## *Natural Language Processing in 2021: What's in store?*

Last year, there was a wave of digitisation in terms of growth in Artificial Intelligence, Internet of Things (IoT), Machine Learning and other such technologies to keep up with the changing dynamics of the industry. In 2021, there will be a greater impact of technology such as translators, chat-bots, and voice assistants to make our lives easier and improve the standard of living.

Among all of this, Natural Language Processing (NLP) – broadly defined as the automatic manipulation of natural language, like speech and text has shown some encouraging and path-breaking developments. Business leaders have started to invest more in it, keeping in mind the umpteen benefits that are associated with it for business sustenance.

NLP has helped in systematising the large amount of data that is generated every moment on social media, which is otherwise not possible to do manually. It has extended support in keeping track of customer's thoughts and the kind of emotion, language and understanding they have towards the brand or product. This has helped product companies to quickly realise consumer behaviour and make relevant changes accordingly.

The approach is changing along with the advancements in technology and there is a scope of improvement that will ensure the smooth functioning of the company. The trends are dynamic and businesses need to adapt according to these trends. Similarly, NLP is seeing growth in the last few years and will definitely be the next big thing in the industry.

Following are some of the areas where NLP can improve business for organisations in the coming years:

### **Advancements in chatbots and voice assistants**

With an increase in the number of smart devices, there is a need to enhance the next generation chatbots and voice assistants. Even now, the programming is done in a systematic way, which gives them the liberty to answer a few general questions asked by the consumers. However, if a question that is not in the FAQ list is asked, it doesn't have an answer. One can expect an improvement in the NLP tools with the help of desk software to give a better experience – like real - time responses – to the consumers, which will in turn help in customer retention.

### **NLP moving from research into production**

This shift from NLP moving from research to production is



something we can look forward to. This is because of the technological advancements in deep learning and transfer learning. This is also one of the major reasons behind increased investments in NLP across various industries. For example, in the healthcare industry, a lot has been done in terms of using NLP algorithms to extract accurate facts from genomic, pathology, lab and radiology reports. In order to make things simpler and lessen the burden on people associated with the healthcare industry, NLP is already being used to highlight high-risk solutions, fast drug recovery, diagnose patients and whatnot.

### Holistic approach towards NLP

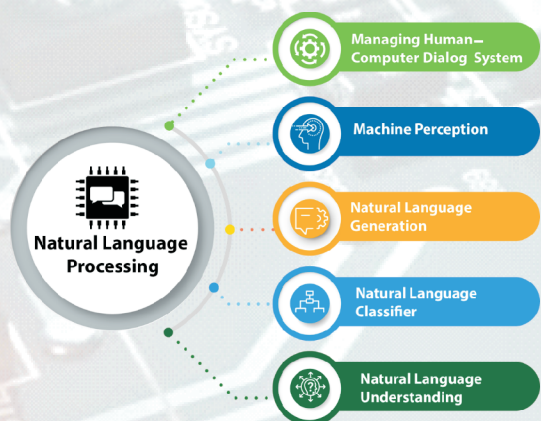
In order to achieve success and favourable results and to structure and scale an NLP project, it is very important to have a deep understanding of how AI works within a product from a business perspective. Without understanding the advantages of integrating AI and its effects on the job function of an organisation, no prediction model or e-discovery system will be successful. For NLP to be successful, organisations should completely understand other technologies associated with it and implement them effectively so as to get the best outcome.

### Deep Learning techniques in NLP models

Along with the advantages of NLP, there are a few shortcomings in the traditional machine learning-based NLP systems. Since these are time-based, it consumes a lot of time and often remains incomplete. These disadvantages can be overcome by using deep learning techniques in the NLP models.

### Way Ahead

It is evident that there is a great scope of improvement in the NLP and looking at these trends in future, it is clear that NLP will be an integral part of businesses. Various leaders in the technology domain have already realised the benefits of NLP, while it will take time to adapt to these changes. Concisely, NLP will improve customer services; analyse the emotions/thought process of the users towards the brand, advance machine learning and artificial intelligence, which in turn will help to manage cost and decision-making for product companies.



**Sandeep Naik**  
BE, Alumnus  
2009 Batch

## Blogs

### How AI and Bots could improve Vaccine delivery

In light of the COVID-19 pandemic, it has become clear that vaccine distribution can dramatically affect the containment of a global virus. Health care organizations are fighting an uphill battle when it comes to delivering vaccines to people in need. Whether it's overcoming hesitancy or keeping up with demand, it's a daunting task. Machine learning and Artificial Intelligence could be the missing pieces needed to improve vaccination delivery. Health care workers are tirelessly caring for patients who've fallen ill and helping prevent the spread of this coronavirus among their co-workers. AI is the bridge that will connect health care and technology.

Until the nuances of AI are fully understood, it is challenging to know how AI can be applied in various industries. Processes in the health care sector, like updating records and obtaining insurance information from patients, lend themselves to be automated. There is more work to be done in AI, it is not yet capable of performing an open-heart surgery! However, there are plenty of ways it can improve the state of the health care industry. In the first half of July, 2021, half of India was vaccinated against the coronavirus. With the help of bots and other ML programs, that number can increase.

Before immunizing people against COVID-19, it was a task in itself to spread the importance of COVID vaccination. Many companies have implemented programs to educate people on vaccine efficiency. Using bots to assist with finding and scheduling appointments has proven to be successful. Still, there are other ways to improve the process. Accurate reporting, one-on-one patient interactions, scheduling assistance and creating supply chains are possible ways for AI to be used in the health care sector. AI, ML and Bot technology are advancing, and determining how to apply them to this industry is crucial. Caring for patients is a priority for health care professionals, and AI will make it easier for them to do their jobs successfully.

**Keerthi Hali**  
VI CSE 'A'

### Taking a Stand!

One of my favourite things is to dream of all the ways I could make a difference in the world. Of course, there are countless ways to do it, and it's very easy to just get lost in my thoughts. I think the real trick, is to find something that can change the world and actually feels doable; something that doesn't require you to do the impossible to actually succeed. That's why lately I've been really fascinated with the idea of simply taking a stand. It's such a simple act but it's probably the most powerful thing a person can do to really bring in change.

It's not that easy, you have to get over the fear of criticism and ridicule in order to take a stand. It's easy to have contempt for something you don't like. Maybe you even get worked up enough to do something about it. But when you're done, what do you have? If it's a success, then you've destroyed something that you thought was unjust from the world. That's useful but what's even more important is standing up for something that will create a lasting change. I think it is the



only way to be truly effective in the long run.

“Standing against” means working to destroy, while “standing for” means working to create. Think about it! If you're disgusted by rape, then it makes sense to stand up against it and the people who do it. You feel passionate about it, so you speak out to tell the world that it isn't okay. But what's the result? The world already knows that and yet it still happens. What if, instead of taking a stand against rape, you took a stand for the equal treatment of women in society? “Standing against” something addresses the symptoms of a problem while “standing for” something is far more effective at actually fixing it.

Creation beats destruction. If you really think that there's world changing message inside you, I am going to give you some tips! Take something you stand against and turn it around! If you don't believe in war, why not fight for peace instead. Use your energy and effort to support a real solution to the underlying problem. Don't beat around the bush and be straight forward. Say it and mean it. Arguments do occur and there's always difference of opinion. If someone disagrees, don't say sorry because it's just their point of view. Change one person. It's not possible to change the world at once. Be patient. Try to change one person's view.

And who knows, in some years the world will be a new place! Start a movement and let the movement do its job. When the room is quiet, shout! When the room is loud, whisper! People always prefer to get the opposite of what the world is providing them with. So, give them that! Take your message out on the road - social media plays an important role here. So, what are you going to take a stand for? How are you going to change the world today?

**Sruthi S**  
IV CSE 'B'

### **Online Learning: Benefits, Challenges and Opportunities**

The internet and technological advancements have always provided humans with a wealth of useful knowledge. When we are happy, we use the virtual world; but, when we are sad, the internet may bring a smile to our faces and provide us with a wealth of information. There are a variety of online learning applications that can be used while in lockdown. For the aim of learning, there are currently a large number of such programmes available on the internet.

The online and virtual world has made a significant contribution to the educational scene. Some of the most important advantages of online learning:

- A flexible schedule for learning while having a good time.
- Learning at a low cost.
- A wide range of topics are covered.
- It saves time for both the learner and the teacher.
- It's natural and eco-friendly.

With India's fast growing internet population, online learning has the potential to become a viable alternative to traditional education, but only if the government properly plans and implements it. Many educators believe that online

education will become the preferred way of learning in the future due to the multiple alternatives accessible.

A considerable portion of the population in rural areas lacks the financial wherewithal to purchase a high-quality smartphone or laptop, which is required to access online education. There is a scarcity of qualified teachers who are familiar with online education platforms and methodologies. While online learning provides a variety of new options for education, it also presents its own set of obstacles.

**Nidhi Srivastava**  
IV CSE 'B'

### **A Train of Thoughts**

The simplest and the easiest to spell is the 4-letter word “L-O-V-E”. Everyone thinks they know about love and feel it's easy to love someone, but in reality, the 4-letter word is the hardest to implement and be consistent lifelong. People fail to understand the actual truth about love, they all would've heard the famous quote which goes like, “Like and love are two different words, if you like a flower you pluck it but if you love a flower you water it daily”.

Do people understand what it means? People call attraction as love, they call infatuation as love, they get confused between the terms “Like” and “Love” most of the time. But the love I'm talking about isn't between a man and a woman. There are other kinds of love as well, where the feeling is the same but the person is different, the relationship with that person is different. Whenever the word “love” is spoken aloud, people tend to picture a man and a woman, not realizing that there are other forms of love and they are unknowingly ignoring that fact. You also love your family, your cousins, your friends, your goals, and all those materialistic things, which isn't wrong. If we were to generalize all this and tell then there is a thin line between liking someone and loving someone.

The difference is that you love someone based on your heart and mind whereas you like someone based on your needs and ego, if you like someone and they break your heart you will stop trusting them and you will call it “fake love” but if you loved someone you will still try to understand them and try to find the depth of why their actions hurt you and forgive them, making peace rather than getting mad at them or leaving them. If you like someone you force them to like you back and try all possible ways, either good or bad to get them to like you. But if you love someone you won't force them, you will confess your heart out and wait. If love is true then it will surely come back, till then you'll keep loving without any greed or ego. Where there is love there is no ego and where there is ego, there is no love. Ego is the only wall between liking someone and loving someone.

It is easy to love someone only when you understand your and the other person's feelings completely and let go of each other's ego. If they love someone or something, then live till the end for the sake of that rather than giving up without thinking of other possible choices. Only a person who has no greed and ego can love others, as love then will be pure, divine, and most importantly, “Selfless!”

**Rakshith Mahishi**  
IV CSE 'B'



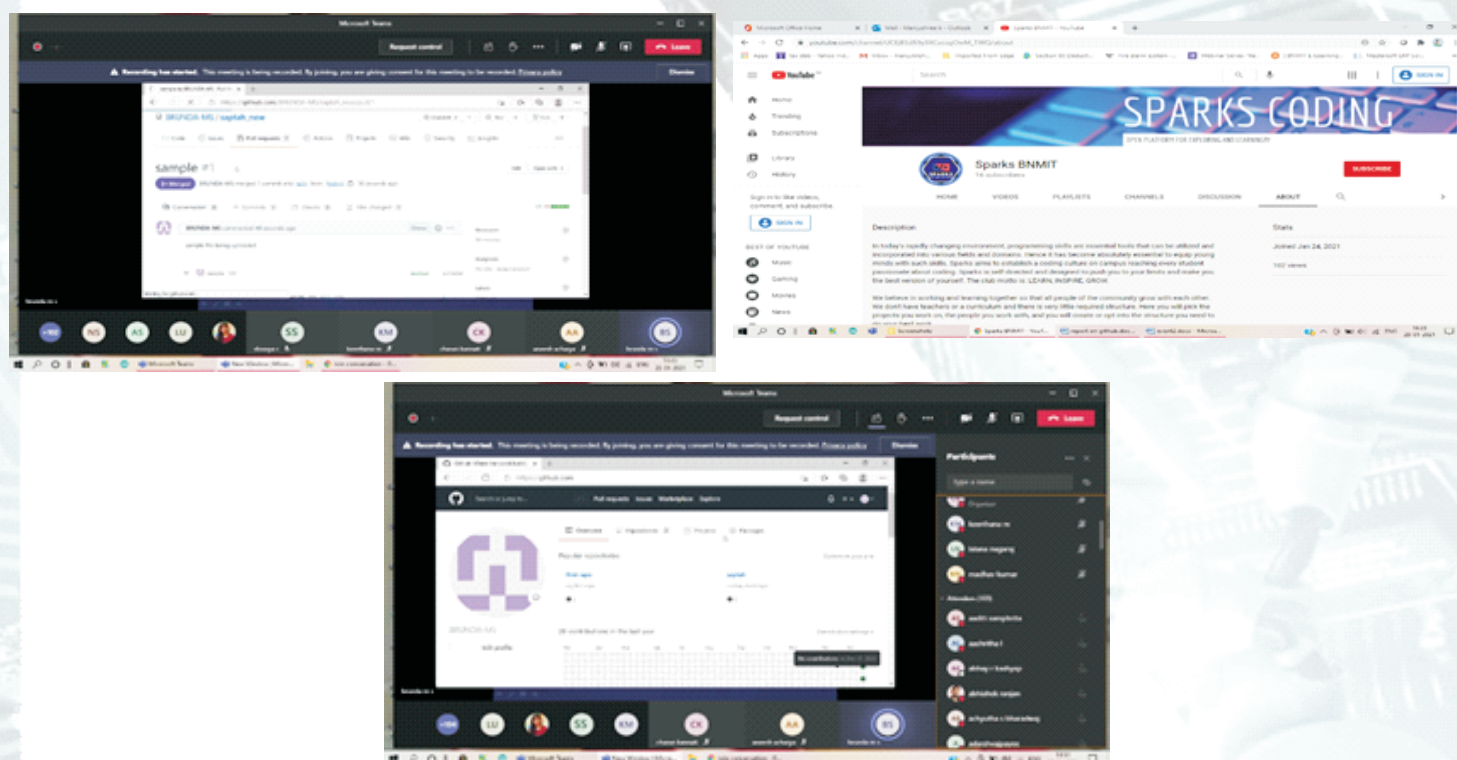
## Departmental Activities

### Webinar on “How to use GitHub?”

The Sparks Coding Club of the Computer Science and Engineering Department organized a webinar on 'Learn how to use GitHub' on 23rd January 2021. It was conducted to enlighten the members about the platform and to make good use of it in their future for projects and coding. The webinar was held on Microsoft Teams.

People use GitHub to build some of the most advanced technologies in the world. Whether you are visualizing data or building a new game, there's a whole community and a set of tools on GitHub that can help you do it even better. There are a lot of applications on GitHub platform to learn a lot. It has many benefits: it makes easy to contribute to open-source projects, we can showcase our codes and projects, etc.

The session started with an introduction to Version Control Systems and its types. An explanation about Git and its advantages were discussed with real-time explanation and examples of Git commands. This was followed by a brief demonstration of creating a repository, editing and committing changes in it; creating, editing and deleting feature branches; creating, uploading and deleting files and other useful features and functions of GitHub repositories. It was then followed by a brief explanation for the upcoming 'Saptah coding challenge'



### Webinar on “How to use GitHub?”

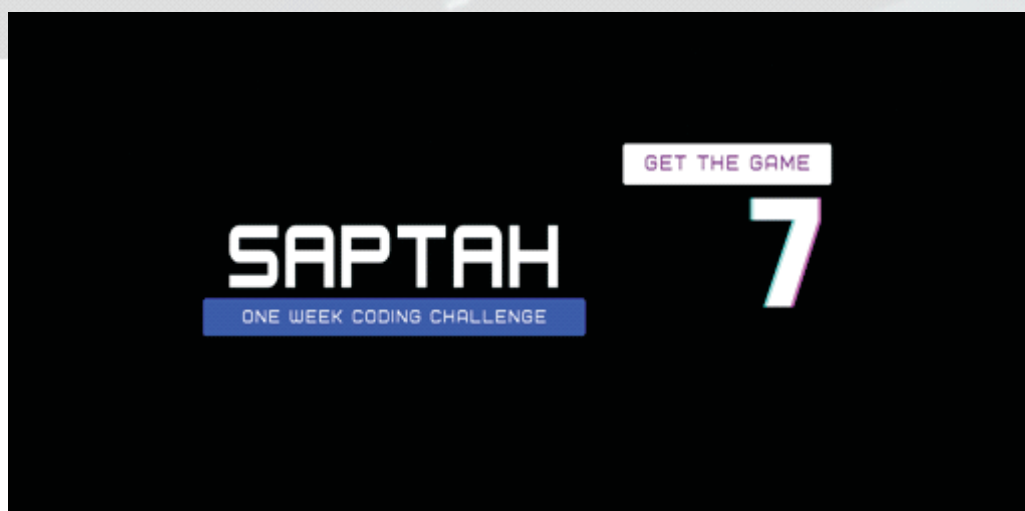
### SAPTAH Coding Challenge

SPARKS club had organized a seven day coding challenge called “SAPTAH”. The challenge started on January 25th and ended on January 31st, 2021. It was held on the GitHub platform with set up of 2 SPARKS coding repositories: first repository was exclusively for 1st semester students and the second repository for 3rd, 5th and 7th semester students. Two different repositories were created to post different level of questions to match the student's exposure to basic coding concepts and ideas based on their semester. Over the week, a question was uploaded each day, to both repositories. The members who had registered for the challenge were expected to login, read the question, fork the repository to their GitHub account and generate a pull request of the answer file which they had typed out. Each question was allotted 10 points and thus the maximum points to be scored from the challenge was 70 points. The club members decided to keep the cutoff at 45 points and the candidates who passed were selected accordingly to receive winner certificates (E-certificates).

SAPTAH Coding Challenge (1 Week) event was conducted after the GitHub webinar as the participants of the coding challenge would be better acquainted with the respective procedure to follow on the GitHub platform and to give the participants sufficient time to create a GitHub account if they did not possess.

The main goal of keeping a coding challenge as an early event of the club was simple. It was to inculcate among the club members the habit of coding daily, and to make sure that they develop a versatile skill set of problem solving and logical thinking.





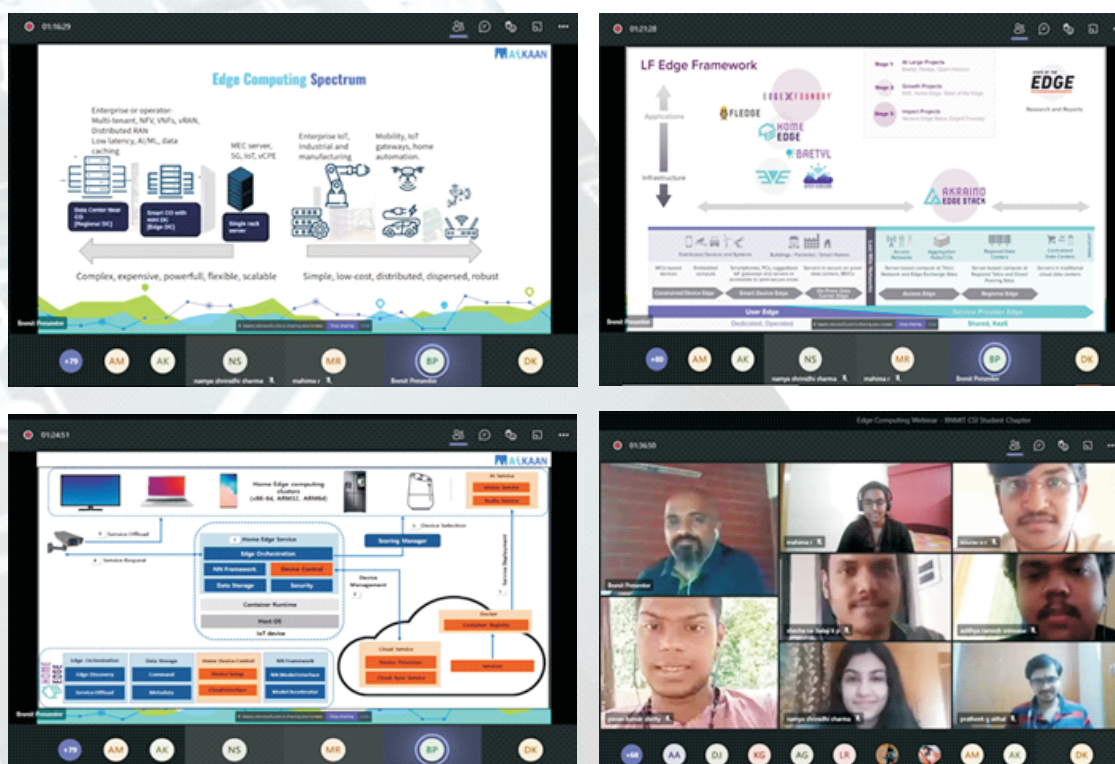
Poster of SAPTAH Coding Challenge

## Webinar on “Edge Computing”

Department of CSE, BNM Institute of Technology, Bengaluru had organized a webinar on “Edge Computing” under BNMIT CSI Student Chapter on 18th June, 2021. Eighty two students from 6th semester Computer Science & Engineering, Information Science & Engineering, Electronics & Communication Engineering and Electrical & Electronics Engineering participated in the webinar.

This webinar introduced students to the world of edge computing and its various applications. Mr. Chetan Kumar, gave the participants a brief summary on the necessity of availing the services of the cloud. This was followed by a brief description of cloud computing and its spectrum, both in terms of cost and functionality. The students learnt that several day-to-day applications implement edge computing including video content delivery, gaming and smart cities to name a few. These applications have an edge over normal applications, since they include enhanced features such as natural language processing, immersive experience and swarming. Topics such as Open IoT, which is supported and promoted by Linux Foundation (LF), Data Architecture were discussed.

The students learnt about Akraino Edge stack, comprising of an “Edge Blueprint” that encompasses components such as 5G and network cloud, and feature projects. The use of EdgeX foundry, an open-source middleware that performs dual transformation functions, from device to device and edge to core/cloud was explained. Edge computing can also be virtualized, as was seen in Project EVE- edge virtualization engine, where the resource person explained its usage and components. This model was also demonstrated on the basis of its practicality in the form of Project Home Edge – an edge computing services platform to enable an intelligent home edge computing open-source framework. Edge computing projects such as Baetyl and Fledge were also discussed.



Webinar on Edge Computing



## Workshop On – “Cloud Computing”

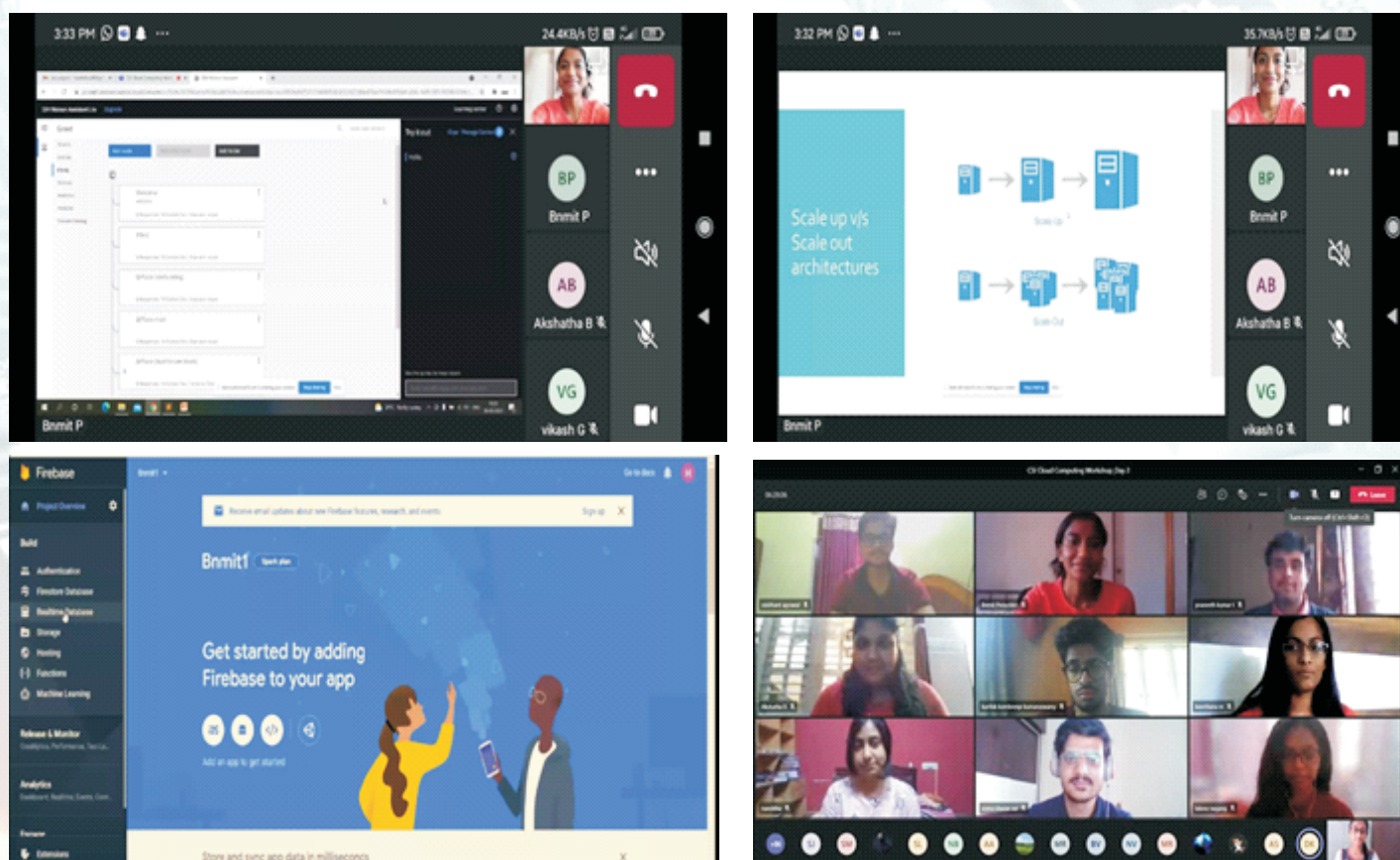
Department of CSE, BNM Institute of Technology, Bengaluru had organized a workshop on “Cloud Computing” under BNMIT CSI Student Chapter on 30th & 31st of May, 2021. One hundred and eight students of fourth semester of engineering, Computer Science & Engineering & Information Science & Engineering branches participated in the workshop.

The session on Day1 started with an introduction to cloud computing and its importance in storing and managing databases. The concept of virtualization in cloud was explained with examples. Service models of cloud, various cloud configurations as well as the AWS architecture was explained. The students were made aware of the procedure to connect to the Amazon EC2 (AWS) website. They were exposed to the procedure to be followed in order to launch an AWS virtual machine.

The afternoon session on Day1 started with the discussion on text editors. Subsequently, the participants were given a brief introduction to the markup language HTML. The basic syntax and tags in HTML were explained. Participants were able to create HTML forms and tables using HTML. They were made aware of the procedure of adding images and hyperlinks to the webpages. Next, an introduction on creating repositories and adding files to Github was given. Participants were then given time to create an online registration form using the concepts taught during the session.

The morning session on Day2 started with an introduction to Firebase software which is developed and supported by Google. Firebase is used in the development of mobile and web applications. Concepts related to Firebase like NoSQL, JSON, Scale-up architecture and scale out architecture were taught. Participants learnt the method of integrating Firebase code into an HTML file in order to store the user details from the online forms. The different components that are part of the Firebase website were explained. Demonstrations on creating a real time database to store the data accepted from the online registration forms were given.

During the afternoon session on Day2, the participants were given time to create a webpage that accepts input from the user, stores the accepted data in the firebase and then displays the data to the user on the webpage. As a part of the concluding session, on request from the participants, the resource person presented the procedure for creating a Chatbot using IBM Watson Assistant. Later the participants were allowed to create their own chatbots.



*Workshop on Cloud Computing*



## Webinar on “Messaging Services in Cloud Applications”


# Department of Computer Science and Engineering

presents

## Webinar on

### Messaging Services In Cloud Applications

Organized by



## Institution of Engineers India (IEI)

### Students' Chapter – BNMIT

**Schedule:**

12<sup>th</sup> June 2021

Timings: 09:30 am – 11:00 am

**Participants:** BNMIT IEI Student Members  
4th & 6th Sem. CSE Students



## Eminent Speaker



**Mr. Mahantesh**  
Software Engineer  
Sakshatech Info Systems  
Bangalore



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TECHNOLOGY

✓Certificates will be provided to all participants

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## B. N. M. Institute of Technology

The Department of Computer Science and Engineering organized a webinar on “Messaging Services in Cloud Applications” on 12th June 2021 under BNMIT IEI Student Chapter. The resource person was Mr. Mahantesh Angadi working as Principal Software Engineer at Sakhatech Information Systems Private Limited, Bangalore. Forty-Six students from fourth and sixth semester of Computer Science and Engineering attended the webinar.

The session started with an introduction to the term “Cloud Computing”. An in-depth explanation was given as to how messaging takes place with big data in the cloud. Useful information was given on how exactly messages flows from the publisher to consumers using JMS Broker. The speaker gave inputs on the open-source software that are available for implementing message services and provided links to the same. An exposure was given to software like Rabbit MQ and use cases were discussed. Overall, the speaker delivered useful information to the students.

## Alumni Series Report



The Department of Computer Science Engineering organized Alumni Series for the academic year 2020-21 on the 19th of June, 2021 on Microsoft Teams platform from 6:00 pm to 7:30pm. It was open to all the students of Computer Science & Engineering and AI & ML. Our alumnus for the evening was Mr. Bishon Boppana, a Software Manager at Manhattan Associates, Atlanta, USA. He has a great exposure to areas like, Distribution Management, Spring Core & Security, SAML, Microservices, Rabbit & Apache MQ, AWS. It was indeed a great pleasure to have our alumnus address the budding engineers by sharing his experiences on the recent industry requirements. His talk on - “Role of Warehouse and its operations in Supply Chain Management” was very interesting and lively to the students.

Mr. Bishon started his talk by introducing and familiarizing our students with the topic chosen - Why should we care about Supply Chain in our daily lives? How does a Warehouse operate? A warehouse management system (WMS) is a key part of the supply chain and primarily aims to control the movement and storage of materials within a warehouse and process the





associated transactions, including shipping, receiving, put away and picking. Next, he mapped what they had discussed with applications - Inbound Processes: Receiving, Sorting, Put away. SCM can be broken down into three vital components: customer service and retention, reducing and controlling operational costs, and improving overall profits by stabilizing costs. Later he took them deep into Core Processes: Inventory, Allocation and played short videos on how it is done in reality in the warehouse. He finally concluded by discussing on Outbound Processes: Task, Picking, Packing, Shipping which involved a short video of how the work takes place from receiving to delivery of the request raised by the customers. This was followed by interaction with students and clarifying their doubts.

## Staff Achievements:

### Patents filed 2020-21

1. **Dr. Srividya R** has filed a patent on “Recommendation Models for Big Data Analysis using Multi-Criteria and Hybrid Collaborative Filter”
2. **Dr. Sreevidya R C** has filed a patent on “QCIU- Education Environment System: Quantum Computing Integrated Development Education Environment Using IoT-Based System”
3. **Dr. Sneha K** has filed a patent on “Efficient MFA method to protect production IT environment”.
4. **Dr. Sejal Santosh Nimbhorkar** has filed a patent on “Underwater image enhancement using Generative Adversarial Network (GAN) with Residual blocks and EDL penalty”.

### Book Chapter published by Faculties

**Karthik Sundararajan** has published a Book Chapter in “Proceedings of ICBDDC-2019, Intelligence in Big Data Technologies – Beyond the hype” titled “Textual feature ensemble-based sarcasm detection in Twitter Data”, Springer 2021, Print ISBN :978-981-15-5284-7, Online ISBN: 978-981-15-5285-4.

### Journal publications by faculty members

1. Engagement detection with Autism Spectrum Disorder using Machine Learning, **Prof. Deepa Mahadev**, International Research Journal of Engineering and Technology (IRJET), Vol. 7, no. 7, e-ISSN:2395-0056, pp. 488-492, July 2020.
2. A Blockchain-based secure and Sustainable Electronics Healthcare Record System, **Prof. Niharika P Kumar**, An International Journal of Perspective of Communication, Embedded Systems and Signal Processing, Proceedings of PaCER 2020 Competition, ISSN(online) : 2566-932x, pp. 87-93, July 2020.
3. Obstacle detection and warning system for visually impaired people, **Prof. Preetham B**, International Journal of Research and Analytical reviews (IJRAR), Vol. 7, no. 3, e-ISSN: 2348-1269, pp. 787-791, September 2020
4. Machine Learning Techniques in Health Care—A Survey, **Prof. Niharika P. Kumar**, Journal of Computational and Theoretical Nanoscience Vol. 17, 1–4, 2020. (SCOPUS).
5. A Survey on Driver Drowsiness Detection Techniques, **Prof. Reshma J**, International Journal of Latest Technology in Engineering, Management & Applied Science, Vol. 9, no. 11, ISSN : 2278-2540, pp. 13-17, November 2020.
6. Deep Learning Model For Identification Of People With Or Without Masks During Pandemic, **Prof. Priyanka S , Manikantha K ,Kavita V. Horadi**, European Journal of Molecular & Clinical Medicine, Vol. 07, no. 08, ISSN 2515-8260, 2020, (SCOPUS).
7. A Comparative Study of Machine Learning Techniques in Heart Disease Detection, **Prof. Sahana D Gowda**, An International Journal of Perspectives in Communications, Embedded Systems and Signal Processing, Vol. 4, no. 10, ISSN : 2566-932x, pp. 264-272, January 2021.
8. Heterogeneous Weighted Voting-Based Ensemble (HWVE) for Root-Cause Analysis **Prof. Sheba Selvam**, Journal of Information Technology Research, Vol 13, no 4, pp 63-74, October–december 2020.
9. Energy aware load balanced Multicast routing in Wireless Sensor Network (EALBMR) ,**Prof. Sreevidya R C, Jalaja G, Sajitha N, Akshitha K**, IT in Industry, Vol. 9, No.2, ISSN (Print): 2204-0595, pp. 1451-1455, 2021



10. Data Governance Model for Tagging Data using Finger Printing **Prof. Deepa Mahadev, Prof. Asha K**, International Journal of Innovation Science and Research Technology, ISSN : 2456-2165, Vol. 6, no. 6, pp. 1489-1491, June 2021.
11. Analysis of Various Medical Image File Formats **Prof. K Asha, Prof. Deepa Mahadev**, International Journal of Innovation Science and Research Technology, ISSN : 2456-2165, Vol. 6, no. 6, pp. 1615-1617, June 2021.
12. Face Mask Detection and Surveillance System **Prof. Preetham Kumar**, International Journal of Scientific Research and Engineering Trends, ISSN : 2395-566X, Vol. 7, no. 3, June 2021.
13. Probabilistic Model Based Context Augmented Deep Learning Approach for Sarcasm Detection in Social Media **Prof. Karthik Sundararajan**, International Journal of Advanced Science and Technology, ISSN : 2005-4238, The Department of Computer Science & Engineering started in 2001 with an intake of 60 students and the present intake is 120. The Department is renowned for imparting quality education with well-qualified and dedicated faculty members, who are experts in various domains of Computer Science & Engineering and strive for an exceptional career growth for the students.
14. Book Recommendation System: A Systematic Review And Research Issues, **Prof. Raghavendra C K**, Journal of Huazhong University of Science and Technology, ISSN : 1671-4512, vol. 50, no. 6, 2021. (SCOPUS).
15. Deep Learning Approach for Video to Text Summarization **Dr. Krishna Murthy**, International Journal of Innovative Research in Science, Engineering and Technology (IJIRSET), ISSN : 2319-8753, Jan 2021.

### Conference publications by faculty members

- Similarity based Collaborative Filtering Model for Movie Recommendation Systems **Prof. Raghavendra C K**, Fifth International Conference on Intelligent Computing and Control System, IEEE, ISBN : 978-0-7381-1327-2, 6th – 8th May, pp. 1143-1147, 2021.
- CNN based U-Net with Modified Skip Connections for Colon Poly Segmentation, **Prof. Raghavendra C K, Prof. Prashanth J**, Fifth International Conference on Computing Methodologies and Communication, IEEE, 8th-10th April, pp. 1762-1766, 2021.

### Student Achievements:

- A Blockchain-based secure and Sustainable Electronics Healthcare Record System, Shreyas B, Srinidhi S P, VIII Sem., Niharika P Kumar, An International Journal of Perspective of Communication, Embedded Systems and Signal Processing, Proceedings of PaCER 2020 Competition, ISSN(online), 2566-932x, pp. 87-93, July 2020.
- Engagement Detection with Autism Spectrum Disorder using Machine Learning, Aishwarya J, Akshath N, Anusha H, Shishira J, VIII Sem., Deepa Mahadev, International Research Journal of Engineering and Technology (IRJET), Vol. 7, no. 7, e-ISSN:2395-0056, pp. 488-492, July 2020.
- A Survey on Driver Drowsiness Detection Techniques, Aishwarya B, Farheen Khanam Z M, G Sai Vennela, Lekhana A V, VIII Sem., Reshma J, International Journal of Latest Technology in Engineering, Management & Applied Science, Vol. 9, no. 11, ISSN: 2278-2540, pp. 13-17, November 2020.
- Credit Card Fraud Detection Techniques, Greeshma N Pai, Kirana R, Likhitha, Madhushree N, VIII Sem., International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056, Volume: 07 Issue: 11, Nov 2020, p-ISSN: 2395-0072.
- Music Recommendation Based on Facial Expression, Mrudula K, Harsh R Jain, Amogha R Chandra, Jayanth Bhansali, VIII Sem., International Journal of Latest Technology in Engineering, Management & Applied Science, (IJLTEMAS), ISSN 2278-2540, Volume IX, Issue XI, November 2020.

### Editorial Team

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