5 hel Newsletter

Department of Computer Science & Engineering

Issue 2

Volume 3 June - 2018 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 environment in students. Objective To achieve educational goals as stated in the vision through the mission statements which depicts the distinctive characteristics of the Institution. To make 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, moulding 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 professional career.
- Comprehend the societal needs and environmental concerns in the field of Computer Science.





from the Department of Computer Engineering, is Science and dedicated to Stephen Hawking who was an English theoretical physicist, cosmologist, author, and director of research at the Centre for Theoretical Cosmology at the University of Cambridge.

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(Approved by AICTE, Affiliated to VTU, ISO 9001:2008 certified and NAAC accredited as grade A Institution)

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Editor's Message

Dear reader,

"The greatest enemy of knowledge is not ignorance, it is the illusion of Knowledge" - Stephen Hawking.

From being a member to turning into an editor, I genuinely had an extraordinary experience in working with the newsletter team. I gladly present "SHELL" - the May 2018 release.

The publication group immensely enjoys re-inventing the wheel. We strive to propagate new thoughts and considerations in light of the current advances in technology and innovation through this newsletter. An addition to this edition, is the "Know your Twitter" and the Technical Puns section. We trust, you get the opportunity to learn new innovations written by students and appreciate what we've set up together as much as we did.

I will flop in my obligation in the event that I don't genuinely thank the tireless endeavours set forth by my team in making this newsletter release a success. I would like to also take this opportunity to thank the Computer Science & Engineering Department on the team's behalf.

Sumuka Gummaraju, VIII A CSE

Department Profile

The Department of Computer Science and Engineering at BNMIT is renowned for imparting state of the art education and carrying out cutting edge research. In addition to the strong UG Program, PG CSE Program and research facilities for M.Sc (Engg.) and Ph.D courses are also offered. The Department has an equipped R&D centre and on going sponsored projects from VTU, DST-IISc and company incubated facilities.

The Department is associated with professional bodies viz. IEEE (USA), ACM (USA), Computer Society of India (CSI), student branch of Institution of Engineers & Indian Society for Technical Education. Major areas of specialization of the faculty include Image Processing, Computer Vision, Pattern Recognition, Computer Networks, Network Security, Embedded Systems, Compiler Design, Wireless Sensor Networks and Data Mining.

The Department organizes National and International conferences regularly. Guest lectures are arranged every semester for the benefit of students. Students are placed in leading IT companies. Students are also pursuing higher studies in reputed Universities around the globe.



BNMIT – CSI Student branch received certificate of institutional accreditation by Computer Society of India, Chennai for the period 1st July 2017 to 30th September, 2019. It is accredited to engage in knowledge sharing, technology and skill upgradation.

- 1. **Surabhi N** of B.E (Computer Science and Engineering) has been awarded as the Best Outgoing Student for the year 2017 2018.
- 2. **Ramyavathsala** of M.Tech (Computer Science and Engineering) has been awarded as the Best Outgoing Student for the year 2017 2018.
- 3. **Rashmi B H** of M.Tech (Computer Network Engineering) has secured 1st Rank and has been felicitated with Gold Medal at the VTU 17th Annual Convocation Jan 2018.

Cryptocurrency

How much for this?

Trading goods or the bartering system is the earliest foundation for the modern day market structure. What started as a means to an end, quickly became the only means of acquiring resources that one lacked. This system of exchanging what one already had in excess for something he needed, though intrinsically simple and direct, it lacked ease of transaction as the items involved in the transaction may pose problems in the form of portability or quality standards. The earliest form of currency used, acted as a token or receipt whose value was directly proportional to the quantity of grains held in storage by the governing body. Hence, the value of the currency itself was derived from the value of the grain. This led to the value of the tokens being unstable due to problems such as the constant raiding of the grain stores. These factors encouraged the adoption of a system where the token of currency itself acted as a store of value, like gold and silver coins. Which proved to be an overall effective system as the gold standard US dollar was issued until 1971. Most modern day currency is fiat currency meaning that it cannot be exchanged for a physical commodity such as gold, through the government. These fiat currencies derive their value from their extent of acceptance as a viable currency and the stability of the economy of the nation backing these currencies. Hence, there couldn't be a better time in the history of civilisation for cryptocurrencies to succeed.

How do they work?

Let's take bitcoin as an example to understand exactly how cryptocurrencies work. The essential processes involved in the life-cycle of a cryptocurrency include mining, distribution and validation. Bitcoin is mined by solving what we could call math problems, the complexity of these problems depends on the supply and demand principle as bitcoin itself is decentralised, more complex problems take more time and more complex hardware to solve. Specialised hardware is now available in the market to solve these problems. Miners are also required to verify transactions, which is the third process. The distribution of bitcoins takes place through special exchanges where bitcoins can be bought for dollars, euros or yen.

Why choose cryptocurrency?

One might ask what makes cryptocurrency a more viable and secure option compared to other types of digital currencies. There are various advantages but the most important ones being its decentralised nature and blockchain technology. Cryptocurrencies are safe from instabilities in the government and form a trust factor based on the peer to peer network. If a government fails so does its currency, but a cryptocurrency would fail only if people stop using it. As cryptocurrencies utilise blockchain technology, each transaction forms a part of a long chain of transactions, with new chains attaching itself to longer chains of transactions, the length of the chain determines the trustability of the transaction. This chain nature of transaction also solves the most prevalent problem in online payments, the chargeback problem. As once a transaction is verified and attached to a chain it cannot ever be reverted hence avoiding the probability of a chargeback through and through.

Will they actually succeed?

Trading in cryptocurrencies such as bitcoin, is still considered a gamble and most investors venture into this field not because they have good vision but because they want to make a quick buck by playing on the volatility in the value of cryptocurrencies. What many fail to notice is that the side effect of this is that more and more people are currently trading in or possess bitcoin, and when in the near future digital transactions become more and more prevalent, the value of bitcoin (or any other cryptocurrency for that matter) will begin to stabilise and it will become widely accepted as a form of currency due to its negligible transaction fee compared to other digital transaction methods. So we are headed slowly but surely toward a world where cryptocurrency would be the norm.

Mohammed Azam VIII CSE 'A'

Depth Sensing Image System

Researchers at MIT have developed a system that can produce images of objects shrouded by fog so thick that human vision can't penetrate it. It can also gauge the objects' distance. An inability to handle misty driving conditions has been one of the chief obstacles to the development of autonomous vehicular navigation systems that use visible light, which are preferable to radar-based systems for their high resolution and ability to read road signs and track lane markers. So, this system could be a crucial step toward self-driving cars.

The researchers tested the system using a small tank of water with the vibrating motor from a humidifier immersed in it. In fog so dense that human vision could penetrate only 36 centimeters, the system was able to resolve images of objects and gauge their depth at a range of 57 centimeters. Although 57 centimeters is not a great distance, the fog produced for the study is far denser than any that a human driver would have to contend with; in the real world, a typical fog might afford a visibility of about 30 to 50 meters. The vital point is that the system performed better than human vision.

"I decided to take on the challenge of developing a system that can see through actual fog, we are dealing with realistic fog, which is dense, dynamic, and heterogeneous. It is constantly moving and changing, with patches of denser or less-dense fog. Other methods are not designed to cope with such realistic scenarios." says Guy Satat, a graduate student in the MIT Media Lab, who led the research. The new system uses a time-of-flight camera, which fires ultrashort bursts of laser light into a scene and measures the time it takes their reflections to return. On a clear day, the light's return time faithfully indicates the distances of the objects that reflected it. But fog causes light to "scatter," or bounce around in random ways. In foggy weather, most of the light that reaches the camera's sensor will have been reflected by airborne water droplets, not by the types of objects that autonomous vehicles need to avoid and even the light that does reflect from potential obstacles will arrive at different times, having been deflected by water droplets on both the way out and the way back.

This system gets around this problem by using statistics. The patterns produced by fog-reflected light vary according to the fog's density: On average, light penetrates less deeply into a thick fog than it does into a light fog. But research indicated that, no matter how thick the fog, the arrival times of the reflected light adhere to a statistical pattern known as a gamma distribution. Gamma distributions are somewhat more complex than Gaussian distributions(the common distribution that yield the familiar bell curve). They can be asymmetrical, and they can take on a wider variety of shapes. But like Gaussian distributions, they're completely described by two variables. Moreover, the system calculates adifferent gamma distribution for each of the 1,024 pixels in the sensor. That's why it's able to handle the variations in fog density that foiled earlier systems.

It can deal with circumstances in which each pixel sees a different type of fog. The camera counts the number of light particles, or photons, that reach it every 56 picoseconds, or trillionths of a second. The system uses those raw counts to produce a histogram — essentially a bar graph, with the heights of the bars indicating the photon counts for each interval. It then finds the gamma distribution that best fits the shape of the bar graph and simply subtracts the associated photon counts from the measured totals. What remain are slight spikes at the distances that correlate with physical obstacles. Satat says. "If you look at the computation and the method, it's surprisingly not complex. We also don't need any prior knowledge about the fog and its density, which helps it to work in a wide range of fog conditions. Objects with different colors and textures are visible through fog at different distances. We use a more rigorous metric called optical depth, which describes the amount of light that penetrates the fog."

Bad weather is one of the big remaining hurdles to address for autonomous driving technology, and this innovative work produces the best visibility enhancement and has the potential to be implemented on cars very soon.

> Sumuka Gummaraju VIII CSE 'A'

Artificial Intelligence and Healthcare

Advanced artificial intelligence is not just making human life easier; its also saving human lives. Though we believe we are in the most technologically advanced state, it would be shocking to find out that about 52.7 million people die every year due to both incurable and late diagnosis of diseases. Another sad, but true fact is that about 40% of the world population under medication cannot afford proper medication.

Studying the statistics we can say that people don't take medicines that they can't afford. But there is little that can be done about the cost of the currently available drugs since the reactants used to synthesize the products are quite expensive, also considering the pharmaceutical market we can say that though we consider ourselves to be in the most advanced stage technically we still do have a long way to go in the world of pharmacy.

For instance, one cycle of chemotherapy and radiation therapy at AIIMS cancer centre costs just rupees 750. But 40% of those getting treated there cannot afford it and request the bill to be waived. Around a billion people cannot afford any health services, and paying for health care pushes about 100 million people a year into poverty, as said by the World Health Organization.

The formation of the required drugs can use the DENDRAL project. This includes the fields of computer science (Artificial Intelligence), Pharmacy and Biomedical instrumentation. The solution of the problem of structure recognition of an organic compound by molecular spectroscopy can be achieved by interpreting only one spectrum or by the elucidation of a set of several spectra of the examined substance obtained by means of various spectral techniques. In this, a scheme of describing general concepts of problem solving, traditional AI was adopted, rather than practical implementation.

DENDRAL is not a single program but a set of programs. Some of these programs may be used alone to perform single subtasks of importance to the problem of chemical structure elucidation. Some may be linked in various ways by different executive programs to form coherent systems for doing larger tasks. To organize the description of this collection of intertwined programs we first note that they comprise basically two systems. The first, called Heuristic DENDRAL is a system that incorporates specific knowledge of chemistry and mass spectrometry, accepts a mass spectrum and other experimental data from an unknown compound as input, and produces an ordered set of chemical structure descriptions hypothesized to explain the data. The second system, called Meta-DENDRAL, accepts known mass spectrum/structure pairs as input and attempts to infer the specific knowledge of mass spectrometry that can be used by Heuristic DENDRAL to explain new spectra. Heuristic DENDRAL is a performance system and Meta-DENDRAL is a learning system.

Artificial intelligence is that part of computer science that studies computational methods for complex symbolic (not necessarily numerical) problem solving. Such mechanization of symbolic reasoning stands in marked contrast to traditional formal methods of problem solving used in science and mathematics. The major approach of artificial intelligence is heuristic programming, which replaces exhaustive enumeration of cases with selective consideration of alternatives.

DENDRAL applies a specific heuristic programming paradigm to the structure elucidation problem and to the task of hypothesis formation.

In conclusion, technology is one side of life that always interests and surprises us with new ideas, topics, innovations, products. It might help in making products unknown to mankind in turn helping us cure the so called incurable diseases. Artificial intelligence methods are a useful tool to find sequences and products in various fields and bolster our chances to find better ways to obtain the much needed element of all our lives. As a result this product entering the real world would not just be a step ahead, but would indeed be a giant leap in the path of technology and healthcare.

Harshitha A & Divya R IV CSE 'A'

Internet of Things Backed by Blockchain

Blockchain and the Internet of Things (IoT) are the most trending topics of discussion in the Tech Community over the past few years. With the dramatic rise of cryptocurrencies and smart embedded systems, a wide variety of unforeseen applications of the technologies behind them have come to light.

Blockchain systems are decentralized, meaning that they are not controlled by a single entity, it is a form of peerto-peer technology which has multiple computers working in synchronous with each other. Internet of Things on the other hand combines connected devices with programmed systems, to make it possible to gather information, analyze it and create an action to help a human with a particular task or learn from a process to make something better and more efficient. IoT devices have a plethora of applications, and as more devices get connected, tons of data will be constantly generated and transmitted from your devices to the internet.

The current generation of IoT systems are designed on a centralized communication model. Devices will have to exclusively go through the cloud and servers, even if they happen to communicate a few feet apart.

While this model has connected computing devices for a long time now, it will continue to support small-scale IoT networks as we see them today, but it will not be able to respond to the growing needs as IoT networks are growing rapidly. In the current scenario IoT solutions are not cost effective; they have high infrastructure, deployment and maintenance costs associated with centralized clouds and servers in addition to networking equipment. However, a bigger concern here is that of data security. In a centralized system, data is vulnerable to attacks and corruption; compromise in even one node of the network can lead to huge security concerns relating to the integrity of the entire system. As more devices get connected to the IoT platform a large portion of user data is being transmitted between many nodes and it is top priority to secure this information and to ensure this data is not misused or tampered in any of the nodes during the transmission of information; that's where Blockchain comes in.

Blockchain is built for decentralized control and a security scheme based on it should be a more viable solution compared to current systems. Blockchain's strong protections against data tampering would help prevent a rogue device from disrupting a home, factory or transportation system by relaying misleading information. Data from a device cannot be tampered or be redirected to illegitimate nodes, thereby providing a more secure layer to the system.

Blockchains decentralized approach would solve many problems currently faced IoT. Adopting the standardized and decentralized peer-to-peer communication model of blockchain to process the billions of communications between devices will considerably reduce the costs associated with the maintenance of large centralized data centers and will distribute computation power and storage requirements as the network of IoT devices scales.

Blockchain is therefore promising for the Internet of Things, it provides assurances that data is authentic, and the process that introduces new data is genuine.

Blockchain will provide a simple networking infrastructure for two IoT devices to directly transfer data between one another with a secured and reliable time-stamped contractual handshake. This enables the independent functioning of smart devices without the need for centralized authority.

Blockchain and the Internet of Things will help us redefine the internet and will help us rebuild our digital infrastructure as we see it now.

> Srigovind Nayak IV CSE 'C'

Technical Talk on World of Compilers, Trends and Techniques

On 28th March 2018, Dr. Darius Blasband, CEO of Raincode Labs, Belgium delivered a talk on World of Compilers, Trends and Techniques to the students of 6th Semester Computer Science and Engineering. The talk organized by ACSIS gave an insight into the recent trends in compiler design such as legacy modernization, transformation and domain specific languages. Dr. Blasband also spoke about various aspects of compilers like Low Level Virtual Machine, parsing techniques and the process of transforming a technology into a product.



Virtual Reality Workshop

A two day workshop on *Virtual Reality* was conducted in collaboration with ITC-IIT, Mumbai, and CSI-BNMIT student branch on 16th and 17th March, 2018. The resource person, Mr. Janardhan Chaudhary is a design



engineer at Design Technology. The topics covered included Need of Virtual Reality, comparison between different VR headset, Google cardboard, Unity software tool, command, importing Google VR SDK to Unity, Linking Unity with Android Studio, Adding texture, audio, text in game, concept of canvas, adding impressive images, concept of GVR recticle pointer, GVR event system, importing game to mobile. Students got the opportunity to develop a Maze game at the end of the workshop. A Technical test and evaluation of the game was conducted at the end of the workshop.

Technical Talk on Internet of Things (IoT)

On 7th March 2018, Mr. Prashanth Raghu, Technical Architect, Sen-Sei Technologies, delivered a talk on Internet of Things (IoT) to the students of Computer Science and Engineering.



The objective of the talk, organized by ACSIS, was to build a strong foundation of IoT and to

talk, build nd to al of the impact of every object becoming a

understand the great potential of the impact of every object becoming a smart object and the connectivity among them with a burst of data flow across the Internet. The talk highlighted about the real-time projects which the students can plan to implement in the field of IoT. After the talk, Certificates were distributed among Activity Toppers.

Exhibition on Internet of Things

On 9th February 2018, the students from the Department of Computer Science and Engineering visited the India Electronics Week at KTPO Trade Centre, Whitefield Industrial area, Bangalore where the Electronics For You (EFY) group had organized a new age technology show. It had 10 conferences and 15 workshops in various domain like smart factory reference architecture, Alexa and virtual assistants, Robotics and Arduino, how to build your own chatbot etc. 150 exhibitor had exhibited their IoT products. Innovations were related to Artificial Intelligence (AI) and Home Automation technology. Companies that were present in the event were 3C TAEYANC, CHIPMAX Design PVT limited, EMSOL Systems etc.. 3D-Thermal printer,



Auto face detection, Home automation, Theft Alarms products were displayed in the exhibition. Students had an opportunity to interact with people in different companies which helped them to seek out for internships.

FCD Event

On 11th March 2018, Mr. Tulasi Dwarakanath, Senior Project Engineer, C-DAC Knowledge Park, delivered a talk on Internet of Things (IoT) to the students of Computer Science and Engineering.

Mr. Tulasi Dwarakanath gave an insight into IoT and to the diverse methods of deploying smart objects and connecting them to the network, comparing different application protocols for IoT and relating various sensor technologies for sensing real-world entities.



The talk highlighted the deployment of CDAC systems connecting Physical world to the Cyber world. It was a platform where First Class with Distinction holders of the odd and even semester 2017-18







Student Achievements

Cultural

- Bhargavi H Venkataram & Vishak R of 8th Sem and Dyuthi S Jahagirdar of 4th Sem bagged the First Prize in Group Song(Indian) in the 18th VTU Fest 2018 held at Angadi Institute of Technology and Management, Belagavi.
- Rahul Niranjan & H C Ullas Prawal of 6th Sem, Shrinidhi H R of 4th Sem and Vishnu R Acharya of 2nd Sem bagged the Third Prize in the Skit in the 18th VTU Fest 2018 held at Angadi Institute of Technology and Management, Belagavi.
- Dyuthi S Jahagirdar of 4th Sem bagged the Third Prize in Light Vocal(Indian) in the 18th VTU Fest 2018 held at Angadi Institute of Technology and Management, Belagavi.
- Mathangi S of 4th Sem bagged the Third prize in Mimicry in the 18th VTU Fest 2018 held at Angadi Institute of Technology and Management, Belagavi.
- Janardhan S of 2nd Sem bagged the Third prize in Classical Instrumental Solo (Non percussion) in the 18th VTU Fest 2018 held at Angadi Institute of Technology and Management, Belagavi.



Kalabhageerathi Team in Cultural VTU Fest 2018

Ambassadors for the year 2017-2018

- 1. Bhargavi H Venkatram, Sindoora R Murthy, Vishak R, Prerana Urs P, Deepak R and Rashmi N are the Cultural Ambassadors of the year 2017-18.
- 2. Sumuka Gummaraju and Vishak R are the Sports Ambassadors of the year 2017-18.

Technical Puns

- 1. Yesterday I was on the computer, I couldn't find the Esc and I lost Ctrl.
- 2. I shouldn't have plugged my iPhone into the PC at the kitchen. It's now in the sync.
- 3. Will this computer last five years? Obsoletely!
- 4. My computer is so slow it hertz.
- 5. When I had my PlayStation stolen, my family was there to console me.
- 6. The man was always leaving himself voicemail messages. He was very self-sendered.
- 7. The computer bug got caught in a spider web.
- 8. If I want to gamble online, do I use betcoins?
- 9. When computer programmers are hungry they take mega-bytes.
- 10. Old programmers never die, they just lose their memory.

Know Your Twitter

- 1. What is the New addressing system introduced by Google ?
- 2. "Public declaration of love for a 'lady' who has come to my country, India. U Simulate me, every bit and byte of u, Sophia." Who tweeted this and in what context?
- 3. "When the zombie apocalypse happens, you'll be glad that you bought a flamethrower. Works against hordes of the undead or your money back!" Who tweeted this?
- 4. "Just setting up my twttr." What's special about this tweet?

Answers: I. Plus Codes 2. Shah Rukh Khan tweeted this when Sophia, the Humanoid said that Shah Rukh Khan is her Favourite actor. 3. Elon Musk, founder of The Boring Company 4. This was the First ever tweet by Jack Dorsey, co-founder of Twttr (now called Twitter)

Editorial Team

Students

Mr. Sumuka Gummaraju - VIII A Ms. Zainab Noorain – IV C Mr. S Akhil – IV B Ms. S Mathangi – IV B Mr. Skanda – IV B Mr. Abhishek J – IV A Staff

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Any suggestion and articles, kindly mail to:bnmcsenl2018@gmail.com