

A Quarterly Newsletter

**Department of
Computer Science
and Engineering**

Volume 2, Issue 4

October – December, 2021

**What we have done in this quarter
collectively as a TEAM!!**

The LNM Institute of Information Technology, Jaipur
Email: hodcse@lnmiit.ac.in

From the Desk of the Head of the Department

A new version/upgrade of a product is launched at regular intervals...a smartphone, an operating system, computing devices, to name a few. The advanced version has incremental changes to its features and attracts more attention from its customer base compared to the previous product. The appreciation for superior technology is not surprising. Each new step by the scientific community leads to major changes in the quality of life.

Starting with single processor systems, changes over the years have led to supercomputing facilities enabling complex computations. Programming languages also did not evolve in a single go. In the words of Dennis Ritchie, the creator of C:

“The original version of C did not have structures. So to make tables of objects, process tables and file tables and this tables and that tables, it really was fairly painful.”

As engineers, we may be contributing to the evaluation of technology, but simultaneously we need to keep adding dimensions to ourselves. As the New Year begins, our resolution can be simple...a slightly enhanced version of our previous self. A new skill, some added learning, an interesting hobby, each contributing to an improved persona. Wishing you all a very happy and fruitful 2022!!



Dr. Preety Singh

HoD, CSE

Computer Science: Fact Check

(From the Desk of the Editor)

History in Computing

- After eleven years of calculating and processing programs, the ENIAC was retired on October 2, 1955.
- The first FORTRAN reference manual was released on October 15, 1956, six months before the first compiler's release. Only 60 pages long, with large print and wide margins, that first programming language was miniscule by today's standard.
- George Boole, the British creator of a mathematico-logical system that bears his name, is born in Lincoln, England on November 2, 1815.
- On November 10, 1983, Microsoft announced a new product, Windows, to compete with other graphical environments for computers, such as interface on the Apple Lisa.
- Richard L. Wexelblat was the first candidate in a computer science program to complete a PhD dissertation on December 5, 1965.

Computing News Around the World

- **Computer simulation models potential asteroid collisions:** Researchers have developed a computer simulation of asteroid collisions that initially sought to replicate model asteroid strikes performed in a laboratory. After verifying the accuracy of the simulation, he believes it could be used to predict the result of future asteroid impacts or to learn more about past impacts by studying their craters. The simulation was built using the space-time conservation element and solution element method to model shock waves and other acoustic problems. (*Source: American Institute of Physics*)
- **How to transform vacancies into quantum information:** Researchers have made a breakthrough that should help pave the way for greatly improved control over the formation of quantum bits or qubits, the basic unit of quantum information technology. (*Source: DOE/Argonne National Laboratory*)
- **Computer attacks with laser light:** Computer systems that are physically isolated from the outside world (air-gapped) can still be attacked. This is demonstrated by IT security experts. They show that data can be transmitted to light-emitting diodes of regular office devices using a directed laser. With this, attackers can secretly communicate with air-gapped computer systems over distances of several meters. In addition to conventional information and communication technology security, critical IT systems need to be protected optically as well. (*Source: Karlsruher Institut für Technologie (KIT)*)

- **Mind-controlled robots now one step closer:** Researchers teamed up to develop a machine-learning program that can be connected to a human brain and used to command a robot. The program adjusts the robot's movements based on electrical signals from the brain. The hope is that with this invention, tetraplegic patients will be able to carry out more day-to-day activities on their own. (Source: *Ecole Polytechnique Fédérale de Lausanne*)
- **System recognizes hand gestures to expand computer input on a keyboard:** Researchers are developing a new technology that uses hand gestures to carry out commands on computers. (Source: *University of Waterloo*)



Dr. Saurabh Kumar
Editor

Research Publications

Journal

- Kaushik Paul, Poulami Dalapati, and Niranjana Kumar, "*Optimal Rescheduling of Generators to Alleviate Congestion in Transmission System: A Novel Modified Whale Optimization Approach*", *Arabian Journal for Science and Engineering*, Springer, pp. 1 - 25, 2021.
- Abhinav Kumar, Anshul Sharma, V. Bharti, A. K. Singh, S. K. Singh and S. Saxena, "*MobiHisNet: A Lightweight CNN in Mobile Edge Computing for Histopathological Image Classification*", *IEEE Internet of Things Journal*, vol. 8, no. 24, pp. 17778 - 17789, 2021.

Conference

- Amulya Sri Pulijala, Aditya Bhattacharjee, Sakthi Balan Muthiah and Suryakanth Gangashetty, "*Raga Classification in Carnatic Music Using Audio Thumbnailing*", *Proceedings of the 9th International Conference on Pattern Recognition and Machine Intelligence (PReMI)*, 15 - 18 December 2021, Kolkata, West Bengal, India.
- Ashutosh Anshul, Ashwini Jha, Prayag Jain, Anuj Rai, Ram Prakash Sharma and Somnath Dey, "*An Enhanced Generative Adversarial Network model for Fingerprint Presentation Attack Detection*", *Proceedings of the 9th International Conference on Pattern Recognition and Machine Intelligence (PReMI)*, 15 - 18 December 2021, Kolkata, West Bengal, India.

- P. Kotak, S. Bhandari, A. Zemmari and J. Joshi, “Unmasking Privacy Leakage through Android Apps Obscured with Hidden Permissions”, Proceedings of the 18th International Conference on Privacy, Security and Trust (PST), 13 – 15 December 2021, Auckland, New Zealand.
- Jatin Kumar, Indra Deep Mastan and Shanmuganathan Raman, “FMD-cGAN: Fast Motion Deblurring using Conditional Generative Adversarial Networks”, Proceedings of the 6th IAPR International Conference on Computer Vision & Image Processing (CVIP), 3 – 5 December 2021, Ropar, Punjab, India.

Book Chapter

- Saurabh Kumar, “Collaborative Processing Using the Internet of Things for Post-Disaster Management”, In: Nandan Mohanty S., Chatterjee J.M., Satpathy S. (eds) Internet of Things and Its Applications. EAI/Springer Innovations in Communication and Computing. Springer, Cham.

Talks / FDPs / Symposium

(A) Expert lectures delivered by LNMIIT Colleagues

- Expert lecture by **Dr. Shweta Bhandari** during the GUJCOST and DST sponsored Short Term Training Programme on “Recent Trends in Information Security and Privacy”, organized by Department of Information Technology, Sarvajanik College of Engineering & Technology (SCET), Surat, October 25 – 29, 2021.
Area: *Cryptographic Approaches to Attain Information Security and Privacy*
Date: 25.10.2021
- Expert lecture by **Dr. Saurabh Kumar** during the AICTE – ATAL sponsored Faculty Development Programme on “Internet of Things”, organized by Department of Computer Science & Engineering, Sree Vidyanikethan Engineering College (SVEC), Tirupati, Surat, October 25 – 29, 2021.
Area: *Localization in the Internet of Things Environment*
Date: 25.10.2021
- Expert lecture by **Dr. Saurabh Kumar** during the GUJCOST and DST sponsored Short Term Training Programme on “Recent Trends in Information Security and Privacy”, organized by Department of Information Technology, Sarvajanik College of Engineering & Technology (SCET), Surat, October 25 – 29, 2021.
Area: *Wireless Sensor Networks: Characteristics, Typical Configurations, Deployment Models*
Date: 26.10.2021
- Expert lecture by **Dr. Vineeta Jain** during the GUJCOST and DST sponsored Short Term Training Programme on “Recent Trends in Information Security and Privacy”, organized by Department of Information Technology, Sarvajanik College of Engineering & Technology (SCET), Surat, October 25 – 29, 2021.
Area: *Smartphone Security: Myths vs Reality*
Date: 27.10.2021

- Expert lecture by **Dr. Shweta Bhandari** during the workshop on “*Deep Dive into Mobile Application Security Analysis*”, organized by CDAC, Hyderabad, November 22 – December 1, 2021.

Area: *Data Exfiltration and Related Issues*

Date: 30.11.2021

(B) FDPs Attended

- **Dr. Saurabh Kumar** attended AICTE – ATAL sponsored online FDP on “*Quantum Computing*”, organized by Applied Sciences Department, ABV-IIITM Gwalior, during 4 – 8 October, 2021.
- **Dr. Preeti Singh** attended AICTE sponsored FDP on “*Incorporating Universal Human Values in Education*”, during 8 – 12 November, 2021.
- **Dr. Nilotpal Chakraborty** attended AICTE – ATAL sponsored online elementary FDP on “*IoT: Design Challenges and Emerging System Applications*”, organized by IIIT Kalyani, during 13 – 17 December, 2021.
- **Dr. Saurabh Kumar** attended AICTE – ATAL sponsored online FDP on “*6G Wireless Communication*”, organized by Electrical Engineering Department, IIT Dharwad, during 20 – 24 December, 2021.

Student Activities

(A) Talk by PhD Student

- **Mr. Arpan Gupta** (PhD student working under Dr. Sakthi Balan Muthiah and Prof. Gorthi) delivered a webinar in the SciTech Talk Forum of Computer Vision.

Area: *Temporal Localization and Visual Word Based Recognition of Cricket Strokes in Telecast Videos*

Date: 11.12.2021

Link: <https://www.youtube.com/watch?v=HP39wqWhto4>

(B) Doctoral Symposium

- **Mr. Arpan Gupta** (PhD student working under Dr. Sakthi Balan Muthiah and Prof. Gorthi) delivered a talk in the doctoral symposium during the Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP), organized by IIT Jodhpur.

Title: *Cricket Stroke Activity Recognition in Telecast Videos*

Date: 19.12.2021

Organized Conferences / Seminars / Symposium / Workshops / FDPs

(A) Workshop

The Centre for Cryptography, Cyber Security & Digital forensics (C3-SDF) and IRT SystemX, Palaiseau France has organized *Second International Workshop on Post-Quantum Cryptography*

(IWPQC) during 10 – 11 December 2021. The workshop has been held in conjunction with 22nd International Conference on Cryptology in India (Indocrypt 2021), organized at LNMIIT Jaipur.

(B) Conference: 22nd International Conference on Cryptology in India (Indocrypt 2021)

The 22nd International Conference on Cryptology in India (Indocrypt 2021) was organized during 13 – 15 December 2021 at The LNM Institute of Information Technology (LNMIIT) , Jaipur, India in association with R. C. Bose Center for Cryptology & Security and The Chatterjee Group-Centers for Research and Education in Science and Technology (TCG-CREST), Kolkata. Indocrypt 2021 is part of the Indocrypt series organized under the aegis of the Cryptology Research Society of India. Indocrypt conference targets researchers and academicians in the areas, which include but are not limited to, new cryptographic primitive proposals, cryptanalysis, privacy issues, cryptographic protocols, quantum/post-quantum cryptography, etc.

Invited Speakers:

- Adi Shamir: A New Theory of Adversarial Examples in Machine Learning
- Karthikeyan Bhargavan: High-Assurance High-Performance Cryptographic Software
- Maria Naya-Plasencia: Quantum Safe Symmetric Cryptography

Tutorial Speaker:

- Daniel J. Bernstein: Quantum cryptanalysis

Glimpses from the Workshop and Conference



How adversarial examples are generated:

- In the old mental image:
 - By moving towards the images of the other class
 - By moving a long distance
 - They are real images on the image manifold
- In the new mental image:
 - By moving in a perpendicular direction
 - By moving a tiny distance
 - They are pseudo images which lie outside the image manifold



Recent Collaborations/MoU

- **Dr. Sakthi Balan** is presently a cooperative research partner (together with his two UG students - Dev Ashish Purohit and Priyanshu Jain) for data analysis in the German Institute for Global and Area Studies' Mozilla-funded research project on "Digital Surveillance and Understanding Its Chilling Effect on Journalists: Finding Strategies and Solutions to Safely Search and Share Information Online" with Dr. Sangeeta Mahapatra. (Period of Collaboration: Aug 2021 to Jan 2022)
- **Dr. Nilotpal Chakraborty** has received startup incubation along with three faculty members and four research scholars at IIT Patna, for the establishment of EVXplorer Pvt. Ltd. from the Technology Innovation Hub, IIT Patna.

Featured Faculty

Name of the Faculty: Prof. Ravi Prakash Gorthi

Designation: Emeritus Professor

Faculty Profile:

- **Academics:** Gold medallist in B. Tech (ECE), M. Tech (CSE) from IIT Kanpur, PhD (CSE) from IIT Madras, Research Fellow (EDRC) at CMU, Pittsburgh. His PhD thesis was in the area of 'Verification and Validation of FOPL Based Systems'.
- Around 25 years of industry experience, mainly with TCS, IBM and Infosys but also 3 years in a Start-up Venture. He holds 4 granted patents as a Principal Investigator



in the area of 'Model Based Software Engineering' and worked and / or consulted with clients in more than 10 countries.

- Around 17 years of academic experience, 6 years at IIT Madras and 11 years at LNMIIT Jaipur. During the 6 years at IIT Madras, he was in the 'Top 5% Club' of all faculty members of all departments for 4 times (club membership based on students' feedback). He has administratively contributed as HoD (CSE), Chief Warden, Chairman (PG Studies), Dean (FA), Dean (AA) for nearly 8 years at LNMIIT.
- His hobbies include (a) travelling and photography - travelled to more than 25 countries (this count is still growing) along with his wife and took many photographs; (b) an active member and executive of Bangalore Toastmasters Club for over 8 years; (c) study of Vedic Philosophy - Shrimad Bhagavad Gita, Upanishads, etc. - under a renowned Vedic Scholar; presented a full-paper titled 'Relevance of Vedic Wisdom to Corporate Career' at International Conference of World Association for Vedic Studies - 2020; working on a book, titled, 'Essence of Vedic Philosophy for Youth'.

Faculty Speaks:

In life, human relationships, founded on profound principles, are more important than talent. Thus, learn and practice human relationships in the right ways. (For example, watch: <https://www.youtube.com/watch?v=pt74vK9pgIA>)

Featured Student

Name of the Student: Mr. Gokul Shah

Batch: B.Tech. Y19 (19UCS121)

Achievement: Branch Topper

CGPA: 9.54

Student Speaks: Hello, everyone. I am a B.Tech. Computer Science and Engineering penultimate year undergraduate student from the Y19 batch. I am thankful to the CSE department for providing me with an opportunity to share my experiences with everyone. This will be a self-reflection on my journey at the LNM Institute of Information Technology, Jaipur. A month before applying to our college, I decided to switch my career to commerce as I come from a business family, but as we all believe that what is meant to be always finds its way, and similar things happened to me. What made me pursue CSE at LNMIIT was that I got to meet some people from the institute who were passionate to bring new ideas and were enthusiastic about bringing changes and as I always had a keen interest in computer science this inspired me to become a part of LNMIIT community.



When I joined college, the first semester went really well. I made a lot of friends; some of them were seniors who helped me fit into college life. The coding environment provided by the institute was also encouraging as I was new to coding. The guidance provided by the faculty members as well as seniors has helped me in growing as an individual as well as

honing my skills. Even when the covid hit us, the institute tried really hard to ease the whole process while being constantly supportive of us. Our queries and requests were heard which really helped us in dealing with this global pandemic.

I also appreciate that the institute provides merit scholarships to students which have been a big motivating factor for me. The institute keeps the curriculum up-to-date by introducing various new courses according to the industry requirements which helps students find their personal fit. The institute also contributes to the integrated development of its students. The curriculum not only provides us with quality education but also helps the student to prevail in their creative interest. The faculties are very supportive and provide their students with the much-needed upswing to excel in their respective fields of interest.

Featured Alumni

Distinguished Alumni: Mr. Pushkal Agarwal

Batch: Y13 (2013-2017)

Current Organization and Profession: Data Scientist, Cognizant UK

Previous Ventures:

- PhD/MPhil at King's College London (2017-2021), London, UK
- Visiting Researcher at The UK Parliament (2021), London, UK.
- Research Internship at Nokia Bell Labs (2020), Cambridge, UK
- Graduate Internship Telefonica I+D (2019), Barcelona, Spain
- Data Analyst at Nielsen (2017), India



Alumni Speaks: I always had a great interest in computer programming, even before my undergraduate degree. In 2013, I was finally walking through a red colonnade known as CP. Yes, it was my day one at LNMIIT. I then spent the next four years of my educational career at LNMIIT. Revisiting those times now, it would not be an exaggeration to say that those four years gave me the most memorable and cherishable moments of my life, possibly to almost all who studied.

I would catalog my experiences in three points – Firstly, I got an overall learning experience from the coursework and project works. These projects proved crucial in my career development, especially while I was applying for jobs and higher studies in the final year. Secondly, the institute, the CSE department and the faculty supported me by providing a platform to perform at various levels. I got the opportunity to showcase my project in the Computer Society of India (CSI), a student chapter and research in ACM WebSci 2017. Last but not the least, the fun I had with my friends cannot be expressed in words. Be it our Tadka plans, movie nights, or just a walk after dinner around the campus, it was always fun to be in this residential campus.

I am also thankful to LNMIIT for awarding me with the Chairman's Gold Medal for best all-round performance in graduating class of 2017, which I dedicate to my Mother.

For the Students: "The secret of getting ahead is getting started" – Mark Twain.

Take proactive steps for learning by yourself. Be curious, ask questions and be ready to participate. Sometimes, intelligence does not come from books. In college one can engage in student communities, competitions and do something different. One way to identify this is

by asking a question- "Will this be an addition to my resume?" If yes, then aim for it and you will find an opportunity one day. For instance, my experience as Chairperson of CSI-LNMIIT.

Also, keep in mind that these four years will not come in life again. You might get busy with your job, higher-studies or family. So once life is back to normal (Covid-19 Free) enjoy your college life at its fullest. Finally, if anyone is genuinely interested in higher-studies or research in the data science field I am always ready to help and guide. You can drop me a message on my LinkedIn below. About me: <https://pushkal17.github.io/>, <https://www.linkedin.com/in/pushkal-agarwal-71535a18/>

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

- Bill Gates