



## A WARM WELCOME TO THE NEW DEPARTMENT CHAIR



We are pleased to welcome Professor Krishnamoorthi Makithaya as the new Head of the Department. Professor Krishnamoorthi has a Ph.D. in Computer Science from MIT Manipal. He has authored/co-authored more than 37 technical articles in refereed journals and conferences. Professor Krishnamoorthi takes over as Head of Department from Professor Ashalatha Nayak who has successfully held the post for the past six years. The department appreciates the efforts put in by Professor Ashalatha Nayak in strengthening the department and would like to congratulate and welcome Professor Krishnamoorthi on his new post.

### Faculty Mentor

Dr. Srikanth Prabhu

### Editor-in-Chief

Ms. Vidhya V.

### Editorial Team

1. Mr. Ashwath Rao B.
2. Mr. Govardhan Hegde
3. Ms. Rajashree Krishna
4. Ms. Priya Kamath
6. Dr. Radhakrishna Bhat
7. Ms. Shana Ailene

## DEPARTMENT EVENTS

### DEPARTMENT WINS 6<sup>TH</sup> RANK IN EW INDIA RANKING SURVEY 2022-23

The Department has won 6<sup>th</sup> rank in EducationWorld India BE B.Tech (computer science) ranking survey 2022-2023.



### INFOSYS SPRINGERBOARD WEBINAR

The Department in association with Infosys has conducted Infosys Springerboard webinar on 7<sup>th</sup> July 2022. Infosys Springboard provides a holistic set of courses developed in collaboration with world-leading digital educators for students from class six to lifelong learners in India. The event was coordinated by Dr. Ahamed Shafeeq B M.

### NBA SENSITIZATION PROGRAM FOR M.TECH STUDENTS

The Department has conducted a National Board of Accreditation (NBA) Sensitization program for M.Tech students on 3<sup>rd</sup> December 2022. The session provided an awareness on the importance of NBA accreditation and its significance for Outcome Based Education.

### ATIS 2022

The Department in collaboration with Deakin University, Australia has organized an "International Conference on Application and Techniques in Information Security (ATIS)" on 30<sup>th</sup> and 31<sup>st</sup> December 2022 in MIT, Manipal. The purpose of ATIS is to provide a forum for presentation and discussion of innovative ideas, research results, applications and experience from around the world. The event was coordinated by Dr. Srikanth Prabhu and his team.



### GUEST LECTURE

The Department organized a guest lecture on "Network Neuroscience" on 11<sup>th</sup> October 2022. Dr. Belfin R. V, a Post-

Doctoral Fellow from the University of North Carolina, USA, delivered the lecture. The event was co-ordinated by Dr. Andrew J.

### FDP ON PART-OF-SPEECH TAGGING FOR KANNADA

The Department organized one day Faculty Development Program (FDP) on "Part-of-Speech (POS Tagging) of Kannada Language - A fundamental Natural Language Processing Task" on 5<sup>th</sup> August 2022. The workshop focused on BIS Part-of-Speech tagset for Kannada and usage of annotation tool Sanchay. The resource person was Mr. Ashwath Ro B. and the coordinators were Dr. Narendra VG and Ms. Musica Supriya.



### TECH TALK

The Department organized a technical talk on the topic "Demystifying Software Patent protection" by Mr. Adarsh Rao Kordcal, Associate Director, KPMG India on 26<sup>th</sup> December 2022. Mr. Adarsh is a strong consulting professional having 20 years cross functional experience and 17 years in patent analysis.

### TRAIN THE TRAINER WORKSHOP

The Department organized a workshop on "Train-the-trainer Module on Good Publication Practices" for the faculty members and research scholars on 30<sup>th</sup> September 2022. The workshop was aimed to discuss comprehensively on plain language summary, graphical abstracts and how to disseminate research on social media platform. The resource person for the workshop was Dr P C Siddalingaswamy.

### GUEST TALK ON WRITING RESEARCH PAPERS

The Department organized a guest lecture on "Writing Technical Research paper" by Dr. Sukhdeep Singh, Senior Chief Engineer - Samsung R&D India- Bangalore and Adjunct faculty of the department on 26<sup>th</sup> November 2022. The session gave an insight on the skills required to accomplish research in the right way and learn the approach of writing technical research papers.

# DEPARTMENT EVENTS

## WORKSHOP ON MORPHOLOGY IN KANNADA LANGUAGE

The Department organized one day workshop on “Morphology in Kannada language – A NLP task” on 30<sup>th</sup> September 2022. Mr. Ashwath Rao delivered the talk along with the practice session. The event was coordinated by Dr. Narendra V.G and Ms. Musica Supriya.

## GE HEALTHCARE VISIT

GE Healthcare team comprising of Mr. Joji George, CTO PCS Digital, Mr. Jeejo Ravindran (alumnus), GM – Operations, and Ms. Surekha Sailesh, Program Manager, visited the department on 11<sup>th</sup> November 2022. Various presentations were given by faculty and students about the healthcare research in the department. The event was coordinated by Mr. Prakash Aithal.



## EXPERT LECTURE ON IOT

The Department organized an expert lecture on “IoT using lightning” by Mr. Sanjeev P. S. and Mr. Sanjay Bhat, Signify Innovations Lab, Bengaluru on 6<sup>th</sup> August 2022. The speakers shared their industry specific knowledge on latest advancements in IoT technologies and its applications. Mr. Sanjay Bhat is an alumnus and Mr. Sanjeev P.S. is external expert Industrial Advisory Committee member of the department.

## PH.D. AWARDEES

Mr. Aditya Bakshi has been awarded doctoral degree by Shri Mata Vaishno Devi University, Katra, Jammu & Kashmir, for his thesis titled "A secure face recognition system with spoofing detection using image quality assessment parameters" under the guidance of Dr. Sunanda.

Mr. Ahamed Shafeeq B. M has been awarded doctoral degree by P.A College of Engineering, Mangalore, VTU, Karnataka for his thesis titled “Soft Computing based Intelligent Clustering Framework for the discovery of patterns from spatial data” under the guidance of Dr. Zahid Ahmed Ansari.

Ms. Sucharita Babu Shetty has been awarded doctoral degree by MAHE, Manipal for her thesis titled “Design of an Efficient Parallel Framework for Transactional and Analytical Queries” under the guidance of Dr. B. Dinesh Rao and Dr. Srikanth Prabhu.

Mr. Prashanth Barla has been awarded doctoral degree by MAHE, Manipal for his thesis titled “Design and Development of non-volatile ALU using hybrid MTJ/CMOS logic-in-memory architecture” under the guidance of Dr. Vinod Kumar Joshi and Dr. Somashekara Bhat.

Ms.Sofia D'Souza has been awarded doctoral degree by MAHE, Manipal for her thesis titled “Prediction of Drug Target Interaction Using Machine Learning Approach” under the guidance of Dr. Prema K.V. and Dr. S. Balaji.

## GUEST LECTURE SERIES ON INTERNET-OF-THINGS

The Department has conducted a series of guest lectures titled “IoT Project Design Discussion” on 8<sup>th</sup> August 2022, 17<sup>th</sup> August 2022, 12<sup>th</sup> September 2022, 28<sup>th</sup> September 2022 and 9<sup>th</sup> November 2022 by Mr. Santosh Kulkarni, Global Transformation Leader, Belron International and adjunct faculty of the department. This series was an opportunity for students with Program Elective "Internet of Things" or having similar interest in the field of IoT Technologies and its applications, to work on industry-collaborated projects involving continuous engagement through online sessions and hands-on training .



## FAREWELL TO COLLEAGUES

◆ Mr. Amitkumar Vinayak Gundad served the department for seven years and was relieved from the duty on 8<sup>th</sup> September 2022. He has been an inspiring teacher who instills the love for learning among the students. He has served the institute as Assistant Director, Office of Industry Liaison Placements and Practice School. He is also a certified Apple IOS trainer and mentored several student projects. He is currently working as technical trainer ( Learning and Development ) in BlueOptima SaaS Private Limited, Bangalore. The department wishes him all the best for his future endeavors.



◆ A farewell was arranged for Ms. Eva Esther Amanna, Senior Clerk, on 30<sup>th</sup> November 2022, who served the department since 1990 for thirty two years. Her sincerity, diligence and commitment towards work during these years was highly appreciated by everyone. She has been very active in the process to support the faculty, the institution and its stakeholders throughout her service. We wish her a happy, healthy and peaceful retired life.



# STUDENT ACHIEVEMENTS

## STUDENT TEAM GRABS FIRST PLACE IN ESAMUDAAY HACKATHON WITH INTERNSHIP / PLACEMENT OFFER

Punith and his team emerged victorious in the eSamudaay Hackathon held during July 2022. The team was awarded a prize money of 25,000INR and offered with placement and internship opportunities.

## STUDENT TEAM WINS SMART INDIA HACKATHON 2022 GRAND FINALE SOFTWARE EDITION

The team comprising of Arnav Agarwal(CSE), Ishita Saha( DSE), Nishant Dash (CSE), Swamiraju Satya Praveen Varma(CSE), Aiswarya Anand (CSE) and Divyansh Kulshreshtha (EEE) won the Smart India Hackathon 2022 - Software Edition with a cash prize of Rs. 1,00,000.



## STUDENT TEAM SECURES SECOND RUNNER-UP IN DICV HACKATHON

Shyam Sundar Bharathi S (CSE), Ajey Rajendra Kumar (CSE), George Paulson (ECE) and Ryan Sojan (CSE) have secured the second runner-up and cash award of Rs.1,00,000 at Daimler India Commercial Vehicles (DICV) Hackathon held during August 25<sup>th</sup> to 27<sup>th</sup> August 2022. The team was mentored by Mrs. Roopashree Shetty.

## STUDENT WINS BEST PROJECT AWARD OF THE YEAR

Pavithra Nayak K won the best project of the year award for the work titled "Experimental Evaluation of Secure Fault Tolerant Sensor Network Communication Performance" in the state level seminar and

exhibition held at Visvesvaraya Technological University (VTU), Belagavi from 12<sup>th</sup> to 13<sup>th</sup> August 2022. The project work was carried out under the guidance of Dr. Radhakrishna Bhat.

## MANY FEATHERS TO HIS CAP



Sohom Datta has been awarded 3133.7USD for identifying the bugs in one of Google's libraries as a part of Google Vulnerability Reward Program. He has received 3133.7USD for identifying issues in Google Dart/Flutter. He was also awarded for reporting security and vulnerability issues in Google Chrome, Mozilla Firefox and synk.io.

## STUDENT RECEIVES COMPTIA SECURITY+ CERTIFICATION

Swayam Tejas Padhy has received CompTIA Security+ ce Certification on 16<sup>th</sup> October 2022. Earners of the CompTIA Security+ certification have the knowledge and skills necessary to perform core security functions required of any cybersecurity role.

## RESEARCH SCHOLAR AWARDED WITH DST INSPIRE FELLOWSHIP



Ashwini Amin, research scholar from the department, has awarded with INSPIRE research fellowship for the research titled "Application of Artificial Intelligence and Image Processing Techniques for Breast Cancer Detection"

by Department of Science and Technology (DST), Government of India under the guidance of Dr. Dinesh Acharya U with the fellowship amount of Rs. 2337360 for 5 years.

## STUDENTS ENGAGEMENT | GOOGLE WOMAN ENGINEERS PROGRAM

Three students - Shagun Mittal, Aastha Chakraborty and Anushka Nag participated in the Immersion week and Bootcamp as part of Women Engineers program offered by TalentSprint and supported by Google. Immersion Week aims to introduce participants to key business skills and help them understand how to navigate the evolving world of tech - professionally and academically.



## TEAM BUGBASE RAISES 4 CRORE PRE-SEED FUNDING



BugBase, the start-up founded by Dhruv Goyal and his team, received pre-seed funding of 4 crore from R2AM VC, Finsight Ventures, Dholokia Ventures and Marquee angel investors.

## RESEARCH SCHOLAR PUBLISHES IN HIGH IMPACT FACTOR JOURNAL

The research paper titled "A trusted IoT Data Sharing and Secure Oracle based Access for Agricultural Production Risk Management" by Manoj T., Dr. Krishnamoorthi M, and Dr. Narendra V. G. has been accepted in the Journal - "Computers and Electronics in Agriculture" having cite score 11.8 and impact factor 6.75.

# ALUMNI MATTERS

◆ Gautam Aggarwal is currently serving as the Chief Technology Officer (CTO) of Mastercard. He is responsible for leading technology and service operations of the Mastercard network in Asia Pacific (AP) and leading the innovation and delivery of AP-specific technology solutions that are globally scalable across Mastercard's products portfolio. Prior to this, He was Group Head & SVP of Domestic & Real-time Payments (RTP), responsible to forge Mastercard's partnerships with domestic schemes to provide RTP technologies in AP.



◆ Mohit, a former MTech student who is now a researcher, co-authored a book on Cryptography and Network Security. His research focuses on Software Defined Networks. He has co-authored many research papers and patents and Tech Books.

◆ Julius Dsouza (2014) got selected as Software Engineer Intern at National Basketball Association (NBA), United States from Jun 2022 - Aug 2022. The National Basketball Association is the premier men's professional basketball league in the world that consists of 30 teams.

◆ Anshumanth (2016) has written and published a book titled "Graffiti Gods"- a college drama set in an engineering college in Manipal. The book is available in Amazon and Flipkart.

# FACULTY ACHIEVEMENTS

- ◆ Ms. Musica Supriya gave a talk on the topic "Machine Translation in Indian Languages: Past, Present and Future" on All India Radio (AIR) Akashvani Mangalore on 7<sup>th</sup> July 2022 and broadcasted on 11<sup>th</sup> July 2022 at 9 PM.



- ◆ Dr. Narendra V. G and Mr Ashwath Rao participated in the Digital Mela Event organised by the Government of India as part of the National Language Transmission Mission from 1<sup>st</sup> to 3<sup>rd</sup> July 2022. The event showcased the Natural Language Processing related project held at Manipal Institute of Technology, Manipal.

- ◆ Dr. Mamatha Balachandra has received the letter of recognition for her professional contribution as the General Chair for the 15th Artificial Intelligence and Cyber Security (AICS-2022) workshop and 13th Cyber Security and Data Mining Competition (CDMC-2022).



- ◆ The Samsung work-let mentored by Dr. Mamatha Balachandra & Dr. Radhika Kamath have been awarded Certificate of Excellence as part of the Samsung PRISM program held during January to August 2022. The teams have also rewarded with Amazon vouchers worth \$900 for the work-lets based on device native utility for creating and modifying ONNX models.

- ◆ Mr. Roshan David Jathanna has handled the "Visualization and App Development" course for 5<sup>th</sup> Semester B. Tech. (Data Science and Intelligent students of IIIT Dharwad during the academic semester August to December 2022.

- ◆ Dr. Neelima Bayyapu, served as general co-chair in the 29<sup>th</sup> IEEE International Conference on High Performance Computing, Data and Analytics (HiPC-22) in Bangalore, India from 18<sup>th</sup> to 21<sup>st</sup> December 2022. She served as program committee member for the International Conference on Applications and Techniques in Information Security (ATIS 2022) at Manipal Institute of Technology (MIT), Manipal from 30<sup>th</sup> to 31<sup>st</sup> December 2022.



- ◆ Dr. Manjunath K N presented their teamwork at the "78<sup>th</sup> Korean Congress of Radiology 2022 conducted by Korean Society of Radiology and Asian Oceanian Society of Radiology" during 20<sup>th</sup> to 24<sup>th</sup> September 2022. He has received travel award of 5,00,000 Korean Wons and won gift vouchers in a few on-spot events. He was a resource person for one-day workshop with hands-on in Python on "signal and image processing" held at M.I.T.E., Moodabidri during 23<sup>rd</sup> to 25<sup>th</sup> November 2022. He has also shared his experience on research paper writing to M.Tech students at N.M.A.M.I.T, Nitte on 30<sup>th</sup> September 2022.



- ◆ Dr. Srikanth Prabhu was the resource person for DST- SERB funded workshop titled "High-end workshop on Clinical and Translational Research for Precision Medicine" on 25<sup>th</sup> July 2022. He also served as technical program chair in the International Conference on Applications and Techniques in Information Security (ATIS-2022) in MIT, Manipal from 30<sup>th</sup> to 31<sup>st</sup> December 2022.

# DEPARTMENT CLUB ACTIVITIES

## IECSE

### Faculty Advisor

Mr. Giridhar. N.S

### Events Conducted

1. Prometheus - 30<sup>th</sup> to 31<sup>st</sup> July 2022
2. Hawkeye - 31<sup>st</sup> July to 1<sup>st</sup> Aug. 2022
3. Enigma ,Online coding and Negative Space - 31<sup>st</sup> July to 5<sup>th</sup> Aug. 2022
4. CodeSprint - 26<sup>th</sup> to 27<sup>th</sup> Nov. 2022
5. PSUC Workshop - 30<sup>th</sup> to 31<sup>st</sup> Dec. 2022

## ACM STUDENT CHAPTER

### Faculty Advisor

Dr. Srikanth Prabhu

### Events Conducted

1. Google STEP Internship - AMA - 19<sup>th</sup> Dec. 2022
2. Knockout and Faded - 13<sup>th</sup> to 14<sup>th</sup> Oct. 2022
3. AMA Sessions on Placements and Internships - 10<sup>th</sup> and 26<sup>th</sup> Aug. 2022
4. Alumni Connect - 15<sup>th</sup> July and 24<sup>th</sup> Dec. 2022



**VISION**

**Excellence in Technical Education through Innovation and Teamwork**

**MISSION**

**Educate students professionally to face societal challenges by providing a healthy learning environment grounded well in the principles of engineering, promoting creativity and nurturing teamwork.**

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**VISION**

**Excellence in Computer Science & Engineering education through continuous learning, research and teamwork**

**MISSION**

**To impart excellent Computer Science & Engineering education for professional roles in a changing and challenging technological world, to advance knowledge through quality research in important emerging areas in the discipline and to build a strong relationship with industry, academia and society.**

**B.Tech Computer Science and Engineering**

**PROGRAM EDUCATIONAL OBJECTIVES (PEO)**

- PEO1: Carry out engineering projects and develop new products in the area of Computer Science and Engineering and pursue higher studies.
- PEO2: Innovate and be creative in the profession; apply analytical skills and demonstrate research capabilities in the field of computer science and engineering.
- PEO3: Work in multidisciplinary environments and be responsive to the changing needs of the society.
- PEO4: Communicate effectively, display leadership skills, and demonstrate professionalism.
- PEO5: Engage in lifelong learning, apply the knowledge judiciously and remain continuously employable.

**PROGRAM OUTCOMES (PO)**

- Engineering Graduates will be able to:
- PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
  - PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
  - PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
  - PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
  - PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
  - PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
  - PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
  - PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
  - PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
  - PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
  - PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
  - PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**PROGRAM SPECIFIC OUTCOMES (PSO)**

- PSO1: Analyse and solve real world problems by applying a combination of hardware and software.
- PSO2: Formulate & build optimised solutions for systems level software & computationally intensive applications.
- PSO3: Design & model applications for various domains using standard software engineering practices.
- PSO4: Design & develop solutions for distributed processing & communication.

**M.Tech Computer Science and Engineering**

**PROGRAM EDUCATIONAL OBJECTIVES (PEO)**

- PEO1: To carry out projects and demonstrate design, analysis, and programming skills to solve computational problems in science and multidisciplinary engineering domain.
- PEO2: Be actively involved in research and development and engage in lifelong learning leading to new innovations to meet the societal challenges.
- PEO3: To take up a career in industry, academia or become successful entrepreneurs and excel as socially committed professionals by respecting ethical practices and maintaining integrity.
- PEO4: To apply the knowledge of mathematics, research methodology and computer science and engineering education to pursue higher studies.
- PEO5: To demonstrate leadership skills, teamwork and effective communication of the technical information and remain continuously employable.

**PROGRAM OUTCOMES (PO)**

- PO1: An ability to independently carry out research /investigation and development work to solve practical problems.
- PO2: An ability to write and present a substantial technical report/document.
- PO3: Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.
- PO4: Apply problem solving skills and advanced concepts in Computer Science to breadth of topics in industrial applications.
- PO5: Use mathematical foundations and research based knowledge for facilitating novel contributions to contemporary areas of computer science.

**M.Tech Computer Science and Information Security**

**PROGRAM EDUCATIONAL OBJECTIVES (PEO)**

- PEO1: To carry out projects and demonstrate design, analysis, and programming skills to solve computational problems in security and multidisciplinary engineering domain.
- PEO2: Be actively involved in research and development and engage in lifelong learning leading to new innovations to meet the societal challenges.
- PEO3: To take up a career in industry, academia or become successful entrepreneurs and excel as socially committed professionals by respecting ethical practices and maintaining integrity.
- PEO4: To apply the knowledge of mathematics, research methodology and computer science and information security education to pursue higher studies.
- PEO5: To demonstrate leadership skills, teamwork and effective communication of the technical information and remain continuously employable.

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- PO4: Apply problem solving skills and advanced concepts in Computer Science and Information Security to breadth of topics in industrial applications.
- PO5: Use mathematical foundations and research based knowledge for facilitating novel contributions to contemporary areas of cryptography and information security.