NEWSBITCSE

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A Half- yearly E-newsletter of the Department of Computer Science and Engineering
Manipal Institute of Technology, Manipal Academy of Higher Education, Manipal

MESSAGE FROM DEPARTMENT CHAIR

As we embark on a new academic year, I extend a warm welcome to each of you. The collective efforts and dedication of both faculties and students have significantly contributed to the department's continued success, and I am confident that this year will bring even more achievements and opportunities for growth. Last year, our department made remarkable strides both in research and teaching. We saw a substantial increase in published papers, successful grant applications, number of workshops and conference, and student accomplishments. I am incredibly proud of the progress we have made as a department.

To our new students, a warm welcome to our department! Your energy and fresh perspectives are invaluable assets to our community. As you embark on this journey with us, I encourage you to explore, innovate, and collaborate with your peers and mentors. Let's maintain our focus on excellence, collaboration, and innovation as we move forward together.

Department Events

RANK 4

QS WORLD UNIVERSITY RANKINGS

RANKING BETWEEN 601-625

INTERNATIONAL CONFERENCE HINT'24

International Conference on Health Informatics, Intelligent Systems, and Networking Technologies (HINT'24) has been successfully conducted at the department from 14th – 15th Mar 2024 in hybrid mode. HINT'24 focuses on the latest topics in computer science and engineering with an intersection of healthcare and other interdisciplinary techniques. Health Informatics, Intelligent Systems, Networking Technologies, Big Data and Data Mining were the main tracks of the conference, and it received 215 submissions from authors of nine different countries.

All selected and presented papers will be published in SCOPUS indexed Springer Lecture Notes in Networks and Systems (LNNS) conference proceedings. There were four eminent keynote speakers namely Prof. Raffaele De Amicis from Oregon State University, USA, Prof. Yasuyuki Tahara from University of Electro-Communications, Japan, Mr. Abhishek Rhisheekesan from aiRender Technology Pvt Ltd, India and Prof. Niranjan U C, President, Biomedical Engineering Society of India. Dr. Andrew J and Dr. Radhakrishna Bhat were the conveners of this conference.

FDP on Quantum Technologies

The department arranged a five-day FDP on "Quantum Technologies" from 12th to 16th Feb. 2024. The workshop covered various aspects of Quantum technologies that rely on the properties of quantum mechanics, especially quantum entanglement, quantum superposition, and quantum tunneling were discussed along with hands-on sessions by Dr. Asvija, Mr. Henry, Dr. Naresh, Mr. Raja and Ms. Sahana from CDAC.

Faculties from department of CSE, ECE, ICT, and Mathematics actively participated in the event. Dr. R. Vijaya Arjunan and Dr. Kishore B. were the conveners of the FDP.

FDP on High Performance Computing

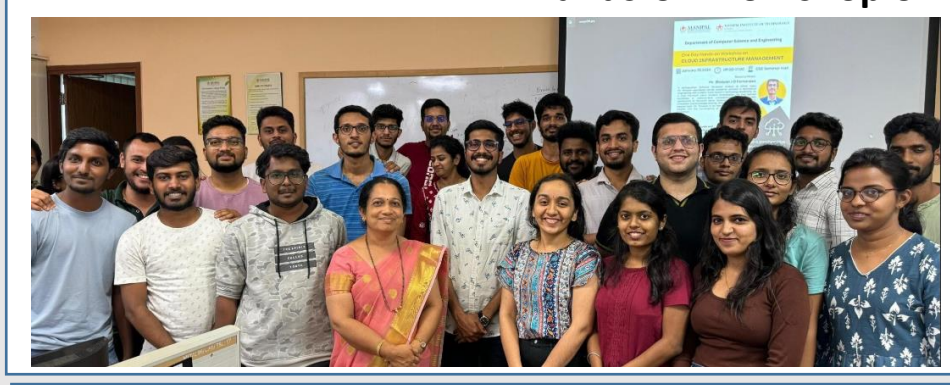
The department, under the sponsorship of the National Supercomputing Mission, organized a four-day FDP on High-Performance Computing from 21st to 24th Feb. 2024, with Dr. Neelima B serving as the convener. The FDP was organized in association with Center for Development of Advanced Computing (CDAC), Pune and Walchand College of Engineering (WCE), Sangli.

The topics included parallel architecture and programming such as OpenMP, MPI, CUDA and GPU architectures, AI for HPC and HPC for AI, Image processing on HPC.

Technical talk on Prompt Engineering

The department arranged a technical talk on "Prompt Engineering" on 19th Jan 2024. The talk was given by Prof Roshan David Jathanna, Deputy Director - Student Affairs, MAHE, and Assistant Professor – Selection Grade, Dept of CSE, MIT, on Prompt engineering, Generative AI, and Google Gemini. All these are significant topics in the field of artificial intelligence and natural language processing. Prompt engineering involves crafting precise instructions or queries to guide AI models in generating desired outputs.

Hands-on workshop on Cloud Infrastructure Management



A one-day hands-on workshop on Cloud Infrastructure Management was conducted by Mr. Shreyan J D Fernandes, Software Developer Analyst at KPMG India, on 25th Jan 2024 at CSE Seminar Hall. Several powerful tools and services were discussed to enhance the skills in effective cloud infrastructure management. The workshop was organized by Dr. Mamatha Balachandra, Professor- Dept. of CSE and attended by 35 participants.

Exploration of IPS: UPI as a case study

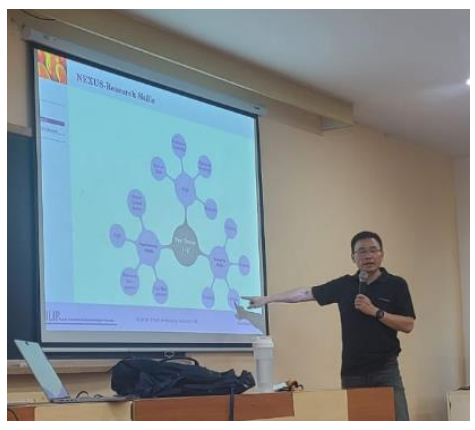
The department hosted a project-based event on 29th Jan and 5th Feb. 2024 exploring the Indian Payment System (IPS), focusing on UPI as a case study. Dr Deviprasad, Software Consultant, served as the resource person, overseeing the selection of project topics and establishing the implementation schedule. Faculty members and students benefited from this initiative.

Session on Emerging Trends in Cybersecurity Research

The Department recently hosted an engaging session on "Emerging Trends in Cybersecurity Research," led by Dr. Meenakshi Tripathi from Malaviya National Institute of Technology (MNIT), Jaipur. Held on June 13, 2024, the event saw over 30 participants, including faculty, research scholars, and students. Dr. Tripathi discussed crucial topics such as privacy-preserving mechanisms, blockchain technology, and drone surveillance. The session also highlighted funding and internship opportunities, as well as potential avenues for research collaboration.

Session on Overview of Essentials for Project Grant Application Writing

One-hour session on “Overview of Essentials for a Project Grant Application Writing” was delivered by Dr. Manjunath K N, associate professor at CSE dept, on 15th May 2024 at CSE Department Seminar Hall. Faculty fraternity had actively participated and gained insights on proper templates for writing grants, detailing on template sections and future possibilities for applying grants.



Interactive Session with Dr. Gang Li

Prof. Gang Li, Professor, Deakin University, and International Faculty of Department of CSE, MIT, Manipal led the session titled, “Transforming Insights into Action: A Guide to Effective Literature Review and Creative Method Development in Research Papers” on 26th March 2024 at CSE Department Seminar Hall. He delved into essential strategies for navigating the complex landscape of research papers by discussing literature review techniques, strategies for analysing and synthesizing research papers, crafting innovative methodologies and proposing new approaches. He also exposed current projects under TULIP lab and invited the students and faculty fraternity for collaboration. The participants gained practical knowledge and tools to elevate the research capabilities, enabling them to engage more deeply with academic literature and contribute meaningfully to respective field of study.

Session on Financial Independence and Retiring Early

A seminar on Financial Independence and Retiring Early (F.I.R.E.) was organized by the department on May 16, 2024. Presented by Mr. Vinayak G Pai, Assistant Professor, Department of CSE, MIT aimed to educate attendees on achieving financial freedom. This seminar was important as it provided valuable insights on achieving financial independence, enabling individuals to retire early and enjoy a self-sufficient lifestyle free from financial stress.

MIT Research Day 2024: A Triumph for the Department of Computer Science and Engineering

Amidst the vibrant atmosphere of MIT's Research Day on April 17th, 2024, the Computer Science and Engineering department stood at the forefront of innovation, highlighting its remarkable achievements and groundbreaking research endeavors. The highlight was securing **Second Place for the department poster** that was put together by the collaborative efforts of **Dr. Ashalatha Nayak and Dr. P.B. Shanthi**. The poster was a testament to the effort and the depth of research undertaken within our department. The **Head of the Department, Dr. Krishnamoorthi Makkithaya** received well-deserved acclaim for his expertise in **receiving patents**. His ability to translate innovative ideas into tangible solutions not only reflects positively on our department but also highlights our commitment to making meaningful contributions to society. **Dr. Srikanth Prabhu, Professor** securing **the Best Researcher award (Computer Science stream)** and **Mr. Krishnaraj Chadaga, Assistant Professor receiving Best Researcher award (Ph.D Category)** further underscores the depth of talent and expertise that exists within our department.

Faculty Achievements

Dr Manjunath K N, Associate Professor has got the membership in International professional Society for Health Economics and Outcomes Research (ISPOR), United States. ISPOR's mission is to promote health economics and outcomes research excellence to improve decision making for health globally.
He also presented a research proposal on “AI Frameworks in Medical Image Analyses” at the European Congress of Radiology 2024 in Vienna, and succeeded in receiving €1600 registration grant. His research team comprises members from the USA, Germany, Bengaluru and an alumnus of the department. Further, he also engaged in discussions on UN Sustainable Development Goals at the Vienna International Centre.
He was also invited to the Artificial Intelligence National Laboratory in Budapest to explore potential collaborations in the healthcare sector and to establish a Center of Excellence at Manipal.
He also received a **patent** by the Indian patent office for the government-funded project to develop low-cost healthcare solutions for the detection of foot complications in diabetic patients. He was one of the members of a five-member team from M.I.T. Manipal.

Dr. Srikanth Prabhu, Professor have figured **among the top five in research publications** per faculty in MIT during 2023.
He also delivered an invited talk at A J Institute of Engineering and Technology in Mangalore on 07 February 2024. The talk highlighted on topics such as Innovation Development Process, Technology Readiness Levels (TRL), and the Commercialization of Laboratory Technologies and Technology Transfer.

Dr. Neha Sureshchandra Gandhi, Professor – Research, conducted a 1-credit workshop on Scientific Computing and Visualization Outcomes. She was a keynote speaker at International AFMD- 2024 Conference held at Chennai during Feb. 2024.

Dr. Prashanth Barla, Assistant Professor – Senior Scale, along with a team of faculty members, have been granted with a **patent** on 05 February 2024 for their invention titled “A self terminating and monitoring self circuit” by The Patent Office, Government of India. Dr. Vinod Kumar Joshi, Additional Professor and Dr. Somashekara Bhat, Joint Director and Professor in the Department of Electronics and Communication Engineering are the co-inventors.

MIT has recently been recognized as a Cisco Networking Academy, enhancing its educational offerings in networking and cybersecurity. **Mrs. Sahana Roshan,** Assistant Professor, a certified Cisco instructor from the department has supported the certification of students, helping them excel in ideathons and virtual internship programs sponsored by Cisco.

The second physical meeting for the funded project titled "Discourse Integrated Dravidian Language - Dravidian Language Machine Translation Kannada - Tamil“ was held on 15th and 16th Feb, 2024 at Anna University K B Chandrashekar Research Centre(AUKBC), Chennai. **Mr Ashwath Rao,** Assistant Professor – Selection Grade, **Ms. Musica Supriya,** Assistant Professor – Senior Scale and two project staffs attended the meeting.

Ms. Roopashri Shetty, Dr. Geetha M. and Dr. U Dinesh Acharya won the best paper award for the paper “An Ensemble Hybrid Classifier to Predict Ovarian Cancer” presented at iDEAAS 2024 conference held from 18/4/2024 to 20/4/2024 at MAHSA University, Selangar, Malaysia.

Ms. Priya Kamath B, Dr. Geetha M. and Dr. U Dinesh Acharya won the best paper award for the paper “Impact of Effective Word Vectors on Deep Learning Based Subjective Classification of Online Restaurant Reviews” presented at iDEAAS 2024 conference held from 18/4/2024 to 20/4/2024 at MAHSA University, Selangar, Malaysia.

Ms. Musica Supriya, Dr. U Dinesh Acharya and Dr. Ashalatha Nayak won the best presenter award for the paper “POS Embedded Machine Translation System for Kannada-Tulu Language Pairs” presented at iDEAAS 2024 conference held from 18/4/2024 to 20/4/2024 at MAHSA University, Selangar, Malaysia.

Non-Teaching Staff Achievements

COVID War Room

Three of non-teaching staff members from the Dept of CSE, Ms. Anupama, Ms. Asha and Ms. Jyothi, received special recognition award from the government of Karnataka for being part of the COVID war room during the pandemic. They were felicitated on 23rd February 2024 by the District Surveillance Unit, Udupi.

PhD Awardees

Dr. Gururaj Bijur, Assistant Professor – Selection Grade has been awarded a doctoral degree by MAHE, Manipal for his thesis titled "Computationally Efficient Multilevel Video Coding" under the guidance of Dr. Karunakar A. Kotegar, Director, International Collaborations, MAHE and Professor, Dept. of Data Science and Computer Applications.

Dr. Rajashree Krishna, Assistant Professor – Senior Scale has been awarded a doctoral degree by MAHE, Manipal, for her thesis titled "Crop disease forewarning based on meteorological data using deep learning techniques" under the guidance of Dr Prema K V, Professor and Head, Dept of CSE, MIT Bengaluru.

Dr Snehal Samanth Assistant Professor has been awarded a doctoral degree by MAHE, Manipal, for his thesis titled "Design and implementation of lightweight cryptographic techniques for secure drone communication" under the guidance of Dr Prema K V, Professor and Head, Dept of CSE, MIT Bengaluru.

Students' Achievements

Celebrating Success at the IGVC

CSE AI/ML student Eshaan Shah and CSE student Yashas Ranjan, serving as Team Manager and Research and Development Head respectively, as a part of team MANAS achieved an exceptional victory at the International Ground Vehicle Competition (IGVC) held at Oakland University in Michigan, USA, from June 2nd-5th, 2024. The team secured first Place Globally in the Design Challenge, triumphing over 20 teams from around the world, including participants from the USA, Japan, Egypt, Canada, and India. This remarkable achievement, rewarded with a $2250 prize, is a testament to the dedication and hard work of our team

MARS ROVER MANIPAL

CSE and CSE AIML students, Rashi Goel (CSE-AI/ML), Harsh Nandwani (CSE-AI/ML), Mustafa Haji (CSE-AI/ML), Prateek Mhatre(CSE-AI/ML), Ankur Monga(CSE-AI/ML) and GangiReddy Siddharth Reddy(CSE) as part of Mars Rover Manipal secured first position in the International Rover Challenge 2024 organized by Space Robotics Society during January 24-29 2024, at PSGiTech, Coimbatore India.

VIII semester CSE Student Mr. Suryaansh Rathiman, got selected for MS(Computer Science, AI , Specialization), at 'National University , Singapore', He did his project at School of Medical Science and Technology, Indian Institute of Technology, Kharagpur, under the supervision Dr Srikanth Prabhu and Dr. Subhamoy Mandal, SMST , IIT Kharagpur. He has also published 4 papers , with different faculty and classmates here at MIT Manipal.

Certificate of Excellence

VIII semester CSE Students Siddhartha Bhat, Sanjana Ganesh Nayak, and their faculty mentor Dr. Mamatha Balachandra, Associate Professor, Dept. of CSE have been awarded with the "Certificate of Excellence" for executing in Samsung PRISM Worklets – 2024. The worklet was titled Development of Security aware Code Assistance (Generative AI).

Mr. Aaron Jomy, a 4th year Student of CSE and a mentee of Dr. Manjunath KN, Associate Professor, is interning at CERN (European Organization for Nuclear Research), Geneva in particle accelerator for an algorithm development. Before that, he had completed a 3-month summer internship at the same organization. Aaron is working on the development of Scientific computing technologies in High Performance Computing (HPC) used by the experiments at CERN.

PHISHTRAP PROJECT

A grant of ₹2,00,000 has been awarded to the project, PhishTrap, from the YUKTI Innovation Challenge 2023 by AICTE. Three students from Department of CSE, Tanmay Saxena, Dhruthi K from B.Tech (CSE) and Kumud Rathore from B.Tech (CSE AIML) are part of the team working under the mentorship of Dr. Nisha P Shetty, Department of ICT, MIT. Out of total 441 teams gone through the funding assessment phase, a total of 135 innovations are found eligible to receive grant assistance from AICTE & MoE's Innovation Cell to work on their innovations to refine further and transform it into startups.

Mr. Vishwas G Kini, Research Scholar, won the best paper award for the paper "Assessment of Usability and Perceived Presence in Virtual Environments for Visual Function Testing" presented at ICICV 2024 conference held from 10/4/2024 to 11/4/2024 at Manipal University Jaipur, India. He is working under the supervision of Dr. Siddhalinga Swamy P. C., Department of CSE, MIT, Manipal.

AURORA CTF 2024

In the recent Aurora CTF 2024, organized by the ISTE and MIST technical clubs on February 8th, 2024, members of the Cryptonite team Rupak Banerjee from the Department of CSE(AI/ML), alongside, Yogesh Rane and Akash, representing the Department of ICT demonstrated exceptional skill and secured the top spots in the competition. Rupak secured second place.

VOICE AI HACKATHON

In the VoiceAI Hackathon by Daas, Aman Agarwal (CSE AI/ML) teamed up with Anirudh Agrawal (BTech CCE) and Yash Bharadwaj (BTech IT) to develop YatriGPT, a travel planning voice assistant. Out of 345 participating teams, their team achieved a notable top 6 position. The hackathon, which began in December 2023, concluded with results announced on February 3rd, 2024.

L&T CREATECH 2024

In the highly competitive L&T CreaTech 2024 online competition held in May 2024, Ashrith Sathu (BTech CSE), Ishan Surana (BTech IT), and Atharva Chepe (BTech IT) clinched an impressive third place. This event brought together top engineering talents from more than 220 leading colleges to propose innovative solutions to real-world business challenges. Their project focused on developing an advanced AI model to analyze sentiment across diverse social media channels like Twitter, Facebook, LinkedIn, and other digital platforms, offering insights into public perceptions of the company.

MAHE cyclists complete Sikkim expedition

SE Report

GANGTOK, June 19: Ten cyclists from The Centre for Outdoor Studies (COS), Manipal Academy of Higher Education (MAHE) successfully completed a cycling expedition around

Ten cyclists from The Centre of Outdoor Studies (COS), Manipal Academy Of Higher Education successfully completed a cycle expedition around East and West Sikkim. One among them was, Ira Lath Gupta (Btech CSE).

Dual Success : Seventh Semester Students Thrive as Full-Time Interns While Completing Their Studies

I secured 6 months internship at NVIDIA as Software engineer in my 6th month. It's one of the best tech companies you can get into as freshers, the culture here is also great. I would like to thank my all the professors, director sir and specially placement department for bringing such great opportunities.

-Aryan Mangla (VII Sem-210905028)

I have got an internship in Moss Adams in the field of full-stack software development. The company is a USA based firm specializing in tax filing and auditing for the past 113 years. I had undertaken several projects during my stay in Manipal which were a highlight to the recruiters. Aside from that my term as VP at AIESEC in the college allowed me to have an avenue to apply in practice all that I learnt. I would like to thank all the professors who taught me not only the topics essential for the course but also prepared me for what to expect during interviews and placement.

-Dhurv Bajaj(VII Sem-210905202)

Mtech CSE & CSIS Publications Status (Jan - June 2024)

Authors	Title	Publications
Student: Meghana G Rao (Mtech CSIS), **Mentor:** Dr D. Cenitta, Dr R. Vijaya Arjunan	Securing Image Using Triple Data Encryption Standard	Conference(Published) IEEE International Conference on Artificial Intelligence for Internet of Things - AIoT 2024
Student: Priyanka R Kunte(Mtech CSIS), **Mentor:** Dr Neelima Bayyapu, Dr Manjunath K N, Dr Neha S Gandhi.	Human Genome Analysis and Encryption: A Cloud Prototype Model Using AWS and AES	Journal (Published) Manipal Journal of Science Technology
Student: Abhishek A K. (Mtech CSIS), **Mentor:** Prof. Deepthi S, Dr Mamatha Balachandra, Dr Prema K V, Dr Kok Lim Alvin Yau	Using Behavioural Biometrics and machine learning in smart gadgets for Continuous User Authentication Purposes	Journal (Accepted) Journal of Machine and Computing
Student: Sowjanya (Mtech CSE) **Mentor:** Dr R. Vijaya Arjunan	Multi-level product classification Using Machine Learning Algorithms	Conference(Published) IEEE International Conference on Artificial Intelligence for Internet of Things - AIoT 2024
Student: Aagam Vipul Bhai (Mtech CSE), Mangipudi Venkata Prajwal (Mtech CSE), Saurabh Kumar (Mtech CSE) **Mentor:** Dr. Renuka A, Prof. Shivaprasad G	Empowering Self Care with Generative Adversarial Networks in medical imaging.	Conference(Presented) International conference on the Impact of AI Driven Decision Making and Agile Management Practices for Sustainable Development – ICADMS 2024
Student: Navaneeth N Kamath (Mtech CSE), Akhil Rana (Mtech CSE) **Mentor:** Dr Manjunath K N, Dr. Roopalaxmi R, Dr Ashalatha Nayak, Dr Neelima B	Parallel Implemenatation of DNA Cryptography Encryption Scheme using MPI and CUDA	Conference (Published) Advances in Electronics, Communication, Computing and Intelligent Information Systems – ICAECIS
Student: Harish N T (Mtech CSE), Mangipudi Venkata Prajwal (Mtech CSE), Saurabh Kumar (Mtech CSE) **Mentor:** Dr. Gururaj, Dr. D Cenitta, Dr Neelima Bayyapu	Gesture controlled robotics: Enhancing automation and safety	Conference (Presented) International conference on the Impact of AI Driven Decision Making and Agile Management Practices for Sustainable Development – ICADMS 2024

Alumni News

Mr. Gautam Aggarwal (Alumnus 1999, CSE) has been selected as a member of the India Advisory Board for the US-India Strategic Partnership Forum. Currently, he is with Mastercard, India as the Division President, South Asia & Country Corporate Officer.

Webinar: " Empowering Futures: Alumni Talk Series Explores Pathways to Success”

In an era characterized by rapid technological advancements, the pursuit of higher education abroad has become an increasingly coveted aspiration among students. Recognizing the importance of guiding students towards achieving their academic dreams, the Department of Computer Science and Engineering, in conjunction with the Department of Information and Communication Technology, organized a transformative webinar on the 30th of March 2024 titled "Navigating the Journey: Pursuing MS in the US." by Mr. Nishith Sinha, Alumni of CSE who currently serves as the Security Engineering Manager at Amazon. Mr. Sinha shared his profound insights and invaluable expertise with the eager audience of B.Tech students. The webinar served as a platform for students to glean firsthand knowledge about the intricacies of pursuing higher education in the United States.

Webinar: "College to Career Readiness"

The Department of Computer Science and Engineering , in conjunction with the Department of I&CT organized an insightful online talk titled “College to Career Readiness” on April 5th, 2024. The session featured Mr. Himanshu Kumawat, an esteemed alumnus of the Department of CSE and currently a Software Development Manager at Amazon. The interactive session was attended by B.Tech students who had the opportunity to ask questions about interview preparation for placements. Mr. Kumawat also shared valuable insights into the types of questions that could be asked during internships, which often lead to full-time positions. Additionally, he highlighted various career opportunities available in different domains.

Alumni Talk: "CONNECT WITH INTEL – DISCOVER, CONNECT, INTERN”

Abhishek Ravoor

Chiradeep Gupta

On 1st March 2024, MIT organized a guest talk titled “CONNECT WITH INTEL – DISCOVER, CONNECT, INTERN” featuring two accomplished alumni from our MTech CSIS 2020-2022 batch as guest speakers. The Intel alumni shared their personal placement journey and insights on innovation and career growth.

Department Club Events

Date: 7/1/24
Git/Github Workshop
Date: 22/1/24
npm i backend
Date: 29/01/2024
Graphs DSA Workshop
Date: 05/02/2024
Arrays & Sliding Window - Code Workshop
Date: 26/03/2024
IECSE Alumni Talk
Date: 25/04/2024
PSUC Workshop 2.0

Date: 1/4/24
Future Focus - AMA session with alumni
Start Date: 03/02/2024 End Date: 04/02/2024
Classified - An ML and NN Workshop
Date: 18/02/2024: Codentine 5.0
Start Date: 19/02/2024 End Date: 25/02/2024
Epoch
Date: 13/04/2024
Internship Talk

Date: 7/1/24
Discourse Analysis

MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

VISION

Excellence in Technical Education through Research, Innovation and Teamwork

MISSION

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

B.Tech Computer Science and Engineering (Artificial Intelligence and Machine Learning)

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

PEO1: Carry out engineering projects, develop new products, and pursue higher studies in Computer Science with emphasis on Artificial Intelligence & Machine Learning.

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 SPECIFIC OUTCOMES (PSO)

PSO1: Analyse and solve real world problems by applying a combination of hardware and software.

PSO2: Formulate & build optimised solutions for computationally intensive applications.

PSO3: Use tools and techniques in Artificial Intelligence & Machine Learning for solving problems.

PSO4: Apply intelligent models for multidisciplinary areas.

B.Tech Computer Science and Engineering
B.Tech Computer Science and Engineering (Artificial Intelligence and Machine Learning)

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.

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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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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 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.