



ICT CHRONICLES

Half Yearly Newsletter of the Department of Information & Communication Technology,
Manipal Institute of Technology, Manipal Academy of Higher Education, Manipal-576104



Welcome to the second issue of ICT Chronicles 2024!

Message From the HOD

As we reflect on the dynamic activities and milestones achieved in the latter half of the year, I am filled with immense pride in our department's vibrant community. This period has been marked by a remarkable conference, "Recent Advances in Information Technology for Sustainable Development," which brought together renowned industry experts, academicians, and students to exchange cutting-edge ideas and insights for a sustainable future. Alongside this, our calendar was enriched with inspiring technical talks by distinguished alumni and industry leaders, as well as hands-on workshops designed to enhance the skills of our students and faculty.

Our students have continued to excel, showcasing their talents and achievements across various domains, while our faculty have pursued innovative research, contributing significantly to their fields. As we look ahead, let us continue to foster collaboration, creativity, and lifelong learning, striving together to achieve new milestones and make a meaningful impact on society and the ICT field.

Patrons

(Cdr.) Dr. Anil Rana, *Director, MIT*
Dr. Somashekara Bhat, *Joint Director, MIT*

Faculty Mentor

Dr. Smitha N. Pai, *Professor & Head*

Editor-in-Chief

Mrs. Swathi B. P., *Faculty*

Faculty Advisors

Dr. Manohara Pai M. M., *Senior Professor*
Dr. Preetham Kumar, *Professor*
Dr. Balachandra, *Professor*

Editorial Team

Prakash Karkera, *Junior Engineer*
Tejaswini Vinod Kamath, *I M.Tech (CNE)*
Sheikh Mohammed Shuhood, *I M.Tech (AIDS)*
Akshay Teja Tumunri, *CR, B.Tech IIIrd Year (CCE)*
Yashya Garg, *CR, B.Tech IIIrd Year (IT)*



Events

ICRAIS 2024



The Department of Information and Communication Technology hosted the 2nd International Conference on Recent Advances in Information Technology for Sustainable Development (ICRAIS-2024) during 6th - 7th November 2024. The conference was endorsed by IEEE and was held in a hybrid mode, accommodating both virtual and in-person attendees. The conference was supported by IEEE Bangalore Section, IEEE Mangalore Subsection, ISAC, Cyberange, Canara Bank, Bank of Baroda, and HDFC Life Insurance Putturu. ICRAIS-2024 showcased the Department of ICT and MIT's commitment to technological advancements. The inauguration ceremony on 6th November 2024 at MV Seminar Hall began with a formal welcome by Dr. Manohara Pai M, Senior Professor in the Department of ICT. This was followed by an opening address from the Chief Guest, Dr. S. N. Omkar, Chief Research Scientist at IISc Bengaluru, who discussed the transformative potential of drones in fields such as disaster management, precision agriculture, environmental monitoring, and logistics. Guest of Honor, Dr. Vinod V Thomas, Registrar Evaluation at MAHE and Professor in the Department of Electrical & Electronics Engineering, spoke about the importance of collaboration between educational institutions and industry to effectively address global challenges. Commander (Dr.) Anil Rana, Director of MIT, presided over the event, emphasizing MIT's role as a leader in technology-driven progress that aligns with sustainable development goals. Dr. Vasudeva Acharya, Chair of the IEEE Mangalore Subsection, expressed his enthusiasm for the event and highlighted how the conference themes align with IEEE's vision of advancing technology for the benefit of humanity. Dr. Balachandra, Professor and the conference convener, provided an overview of ICRAIS 2024, detailing the objectives and the diverse range of topics covered, including Distributed Computing, Networking and Communication, Information Security, and Soft Computing. He emphasized the conference's significance in fostering innovative research and collaboration. A memorable moment of the ceremony was the unveiling of the ICRAIS 2024 souvenir, symbolizing the collective efforts of the organizing team. The session concluded with a heartfelt vote of thanks delivered by Dr. Preetham Kumar, Professor, who acknowledged the collaborative efforts of everyone involved in making the event a success.

First Year Orientation



The department hosted an engaging orientation program for first-year students of the ICT department from 17th to 19th July 2024. The event featured a diverse range of sessions designed to motivate and support students in various aspects of their academic and personal development.

Key highlights included alumni talks on leadership development, effective time management, placement preparation, and examination strategies. Additionally, sessions were conducted on maintaining mental health, cultivating a productive student lifestyle, developing interpersonal skills, managing stress and substance abuse, handling anxiety, and exploring yoga and Ayurveda. A notable technical talk on "Ethics and Morality in AI" was also part of the program.

The orientation featured esteemed speakers such as Dr. Sanjay Singh and Dr. Nisha P. Shetty (Faculty, ICT Dept), Ms. Muskaan Budhraja (Alumna), Mrs. Prathibha Lydia Braggs (Research Scholar, Manipal College of Nursing, MAHE), Dr. Umesh Thonse (Faculty, Psychiatric Social Work, Department of Psychiatry, KMC), Dr. Savitha Prabhu (Assistant Professor, Department of Psychiatric (Mental Health) Nursing, Manipal College of Nursing), Dr. Soyuz John (Assistant Professor, PSW), Dr. Shwetha T. S. (Associate Professor and HOD of Clinical Psychology, Manipal College of Health Professionals), Dr. Veeraj Praveen, Dr. Rayan, Ms. Sujatha, Mr. Jeevan, and Mr. Cavin (Student Counsellors, MAHE).

The program also included a campus visit, meticulously coordinated by the ICT Department faculty, offering students an insightful glimpse into their future academic environment.

IIIrd Semester Orientation



An orientation program was organized for the third semester students of B. Tech IT & CCE on 25th July 2024 at the Library Auditorium, MIT, Manipal.

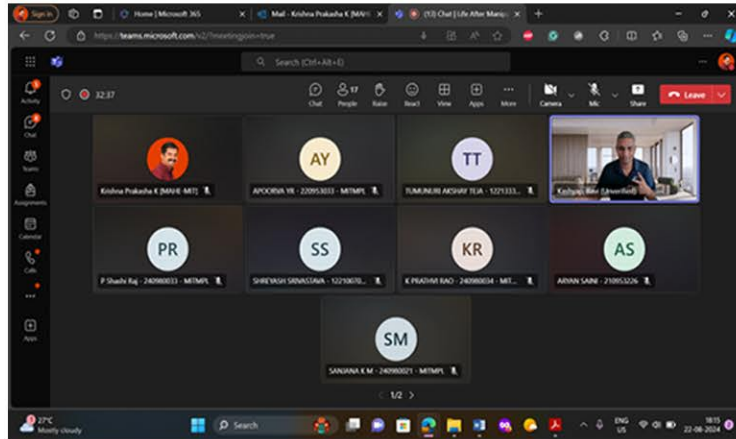
Dr. Ajitha Shenoy, Professor and Class Committee Chair for the third semester CCE, welcomed the students and speakers. Dr. Smitha N. Pai, Professor and Head of the Department, started the session by detailing the department's history from its inception. She elaborated on academic processes and highlighted various achievements of the students, alumni, faculty, and the department. Dr. Sucheta Kolekar, Associate Professor and Assistant Director – Innovation & Incubation, shared details of various incubation centers, activities, and opportunities. Dr. Kaliraj, Associate Professor and Department Placement Coordinator, provided statistics of placements and internships. Dr. Poornalatha G., Additional Professor and Department Research Coordinator, explained the facilities and support provided by the department, institute, and university towards student research. She emphasized the importance of ethics in research and familiarized the students with MAHE's policies on publication and research. She also explained the research-related facilities and support available. Dr. Santhosha Rao, Additional Professor and CEO of MUTBI, briefed the students about various startups and their advantages. He encouraged them to plan for their own startups and informed them about different policies. The program concluded with a vote of thanks by Dr. Poornalatha G., Class Committee Chair for the third semester B.Tech IT.

Faculty Development Program



Department of Information & Communication Technology in association with IBM conducted a 3 day faculty development program on Exploring genAI from 10th July 2024 to 12th July 2024. The chief guest of the inaugural function was Anjana Hariharan, Executive Partner, IBM Consulting and Cdr. (Dr.) Anil Rana presided the ceremony. Around 40 faculty participated in the programme. Mr. Tanveer, Mr. Sarthak Mishra, Ms. Isha Aneja, Mr. Vinay Kalmoodkar, Ms. Khushboo Tak, Mr. Yogesh Narasimha, Mr. Sachin Mudholkar were the speaker from IBM who furnished important topics from genAI such as large language models, fine tuning them, prompt engineering, few shot learning, RAG so on so forth. The programme was coordinated by Dr. Kaliraj as the Convener and Dr. Siva Kumar and Dr. Adesh as Co-Conveners.

Alumni Talk



An alumni talk with the title “Life after Manipal. Career, Journey and learning “ was given by Mr. Ravi Kashyap. The talk was organized on 22nd August 2024 in online mode . The speaker provided an in-depth account of his time at Manipal Institute of Technology, reflecting on various aspects of his experience. In addition to his academic and personal experiences, the speaker delved into his technical experiences, highlighting any relevant skills or knowledge he acquired. He recounted his placement experiences, including the challenges he faced and the opportunities he seized during that period. Throughout the presentation, the speaker took the time to address and clarify any doubts or questions from the students, ensuring they had a clear understanding of his experiences and career progression. The event was coordinated by Ms. Veena KM, Faculty, Department of I&CT.

Sharadha Pooja



During Navaratri on 10th October 2024, Sharada Pooja was offered in the department, with faculty, staff, and non-teaching members participating in the rituals. The celebration honored Goddess Saraswati, symbolizing knowledge and wisdom, and included a soulful bhajan by Dr. Preetham Kumar, enhancing the spiritual atmosphere

Alumni Visit



Our alumni Datrga Shafeeqa Almaas, CCE - 2021, Senior Developer at Optum visited us on 22nd November 2024.



Faculty Achievements

Pehle APP: An App literacy workshop



Dr. Divya Rao conducted sessions in the Pehle APP: An App literacy workshop organized by KMC Manipal on 26th July 2024. During the first session, Dr. Divya focused on conducting a literature search for existing applications. The goal was to ensure that one does not duplicate efforts, and leverages best practices from other successful apps. She discussed how to identify gaps in the market, understand user needs, and evaluate existing solutions to inform our development process. In the second session, Dr. Divya addressed the process of submitting requirements, particularly in light of the significant domain differences between doctors and engineers. She emphasized strategies for effectively bridging this gap, ensuring that requirements are communicated in a manner that is clear and actionable for both parties. A total of 30 doctors from KMC Manipal, along with several research students, participated in this one-day workshop.

Hands-on session



Mrs. Swathi Prabhu was the resource person for a hands-on session on "Traditional Machine Learning Approach for Histopathological Image Analysis" for the B.Tech students at P.A. College of Engineering, Mangalore, on 19th July 2024. This session was part of a three-day workshop titled "Transforming Biomedicine: The Power of AI and Machine Learning," held from 18th to 20th July 2024.

Session



Dr. Balachandra, Professor has conducted a session on "Protect Yourself from Cybercrime" to the newly joined students of Manipal Institute of Communication, Manipal on 26th July 2024.

Guest Talk



Ms Chetana Pujari was invited to deliver a talk to engineering and graduate students on 4th August 2024 at an event organized by Yakshagana Kalaranga vidya phoshak samsthe, held at the Infosys Foundation Yakshagana Development, Training, and Research Centre. The event saw the participation of around 200 students.

Best Paper Award



The research paper titled "Performance Evaluation of Pre-Trained Models for Classification of Vocal Cord Paralysis over Vowels" presented by Ms. Jayashree Hegde K, Research Scholar, guided by Dr. Manjula Shenoy K, Professor, Department of Information and Communication Technology, MIT, Manipal and co-guided by Dr. Devaraja K, Associate Professor, Department of Otolaryngology, Kasturba Medical College, Manipal has been awarded the Best Paper Award at 2nd IEEE International Conference on Networks, Multimedia and Information Technology (NMITCON 2024) organized by Nitte Meenakshi Institute of Technology, Yelahanka, Bangalore from 9th - 10th August 2024 in association with IEEE Bangalore Section.

Online Session



Dr. Balachandra has conducted an online session on "Cybersecurity" to the officials of Revenue Dept. conducted by District Technical Institute, Bangalore On 17th August 2024

Keynote Speaker



Dr. Manohara Pai was invited as a keynote speaker on the topic "AI and Digital Transformation in Orthopedics and Energy Management" at the esteemed "National Conference on Technology and Innovation in Healthcare, 2024", hosted by Vinayaka Missions Sankarachariyar Dental College at Salem on 23rd and 24th August 2024

COE-AI

MAHE proudly recognizes Dr. Ajitha Shenoy K B, Faculty, Department of I&CT, with a certificate of appreciation from Dr. Narayana Sabhahit, Pro Vice Chancellor (Technology & Science), MAHE, Manipal and Lt Gen (Dr) M D Venkatesh, Vice Chancellor, MAHE, Manipal on 28th October 2024 for his valuable contributions to the establishment of Centre of Excellence (COE) in Artificial Intelligence in the field of Healthcare.



Session

Dr. Balachandra has conducted a session on "Cybercrime and Cybersecurity" to students of Muniyal Ayurveda College, Manipal conducted by Rotary Club, Manipal on 30th September 2024.

Talk

Dr. Kaliraj, Faculty, Department of I&CT, delivered a talk on "Trends in Threat Analysis of Cyber Attacks in Machine Learning" in online mode on 23rd October 2024, which was organized by Department of Computer Science and Engineering and Department of Information Technology, Vardhaman College of Engineering, Hyderabad.

FDP

Dr. Ajitha Shenoy, Faculty, Department of I&CT was the resource person for the five days FDP on "Data Analysis in Social Science" during 22nd October 2024 to 26th October 2024 organized by Caculo College of Commerce & Management Studies, Mapusa, Goa.

Faculty Advisor - MAHE Research Day 2024



Dr. Divya Rao represented MIT's Apple Developer's Group as the Faculty Advisor during MAHE Research Day 2024, held on 13th – 14th November 2024. Apple Developer's Group won the Best Stall award in the Collaborate section under the Allied Health and Other theme. The event, hosted by the Manipal Academy of Higher Education, celebrated innovation and interdisciplinary collaboration at the university. This recognition highlighted the student club's outstanding contribution via APP-A-THON 2024, which connected doctors and student developers and resulted in the development of unique and useful apps in healthcare.

FDP

Dr. Anoop B N has successfully completed a two-week faculty development training on Genertive AI and its Application from 19th November – 04th December 2024 organized by EduxLabs (Esoir Business Solutions LLP) in association with Mechanica IIT Madras.



Workshop

Dr. Anoop has successfully completed the workshop conducted by Techfest, IIT Bombay during December 2024.

Resource Person - Workshop



Dr. Balachandra was invited as a resource person for the workshop on " Data Structures and it's Applications: Exploring towards Employability Skills" by Navkis College of Engineering, Hassan on 13th and 14th December 2024

Article on Scopus

Celebrating 20 Years of Scopus: Empowering Discovery Since 2004

Author: *Dr. G. Pradeep Reddy*



Scopus is a comprehensive abstract and citation database from Elsevier officially launched in November 2004. Over the past two decades, it has become an essential tool for researchers, scholars, and academic institutions worldwide, facilitating the discovery of scientific knowledge and fostering collaboration across various disciplines. The concept of Scopus emerged during a brainstorming session in a small Dutch town, inspired by the navigation skills of the Chiffchaff bird. The bird's Latin name, PhyllosCOPIUS Collybita, resonated with the team's goal of creating a tool to navigate vast information. While there are a few other notable platforms, such as Web of Science (from Clarivate Analytics), Scopus stands out for its extensive coverage of scientific literature across numerous disciplines. By indexing journals from diverse publishers and fields, it empowers researchers with deeper insights into the impact and reach of their work.

Over the years, Scopus has consistently evolved to meet the needs of the research community, beginning with the establishment of the Content Selection & Advisory Board (CSAB) in 2005 to uphold rigorous quality standards for indexed content. The introduction of Author and Affiliation Identifiers in 2006 and 2007 enhanced the accuracy of author disambiguation and institutional performance analysis. The integration with ORCID in 2012 facilitated seamless researcher identification, while the release of CiteScore in 2016 offered a transparent alternative to traditional impact factors. In 2021, Scopus expanded its scope by including preprints from platforms such as arXiv and ChemRxiv and added data supporting the UN's Sustainable Development Goals (SDGs). Most recently, the introduction of Scopus AI and its Co-Pilot feature in 2023-2024 leveraged artificial intelligence to enable advanced discovery and insights. Academic institutions heavily rely on Scopus for research management, institutional rankings, and funding opportunities. Universities use their analytics to benchmark their performance, identify collaboration opportunities, and evaluate research impact. Faculty members benefit from its detailed author profiles and citation tracking to enhance their academic visibility. As Scopus celebrates its 20th anniversary, it continues to be a vital resource in fostering collaboration, innovation, and the advancement of science. By constantly adapting to the needs of the academic world, it remains at the forefront of research discovery, driving meaningful contributions across disciplines.



Student Achievements

Student Council

We are delighted to announce the students from the Department of I&CT who have taken up prestigious roles in the MIT Student Council (2024-25):



President

Vannela Harshvardhan Reddy

Vice-President

Nehal Verma



Joint Secretary

Nandini Agarwal



Simran Jain

Cultural Secretary

Yashya Garg



Khushi Sethi

Placement Secretary

Aditya Kumar



Technical Secretary

Dillon Almeida



Joint Technical Secretary

Arushi Ajmani



Deputy Chairperson, 'E-Cell'

Abhimanyu Singh

Editor-in-Chief, 'Editorial Board'

Daksh Loiya



Joint Sports Secretary

Mayurika Sathish

CSAW CTF

The team Cyptonite comprising of Yadavalli Venkata Subba Rama Akash (BTech. IT), Yogesh Prashant Rane (BTech. CCE), Prashanth J Kumar (BTech. IT), Madhav Menon (BTech. CCE), Rishab Bacchawat (BTech. I) and Dr. Nisha (Faculty Mentor) qualified in the CSAW CTF Qualification Round 2024 held during 6th - 8th September 2024 which was organized by New York University (NYUSEC) in the online mode. With over 1181 teams competing and more than 30 problem statements from varied domains, it remains one of the largest and most prestigious CTFs worldwide. The team has also secured 4th place globally in CISA ICS CTF 2024 held during 31st August – 4th September 2024 which was organized by America's premier Cybersecurity and Infrastructure Security Agency (CISA) ICSJWG. CISA's annual Capture the Flag (CTF) focuses on incident response scenarios with attacks on critical infrastructure. With over 1193 teams competing, the event showcased the growing interest and need for robust cybersecurity measures to protect essential services.

Samsung Solve for Tomorrow 2024

Ms. Shambhavi Sinha (BTech. CCE) is the Winner of Samsung Solve for Tomorrow 2024, honoured as 'Environment Champion' in the Youth Track for innovative technology in arsenic removal from groundwater. She received a grant of ₹50,00,000 for incubation at FITT, IIT Delhi. The event was held on 4th October, 2024.

NSRCEL (Cohort 2)



Ms. Shambhavi Sinha (BTech. CCE) was the recipient of INR 5 Lakhs Grant – Campus Founders Program, NSRCEL (Cohort 2). She was awarded for exceptional performance in program participation, mid-review and end-review scores, clarity of venture plan, and mentor recommendations. The program ran from 12th May 2024, to 13th September 2024.

Edge AI Innovation Challenge 2024



Varanasi Naga Akhil (BTech. CCE) was one of the Finalist in Edge AI Innovation Challenge 2024 held on 4th October 2024.

Young Entrepreneurs Track

Ms. Shambhavi Sinha (BTech. CCE) was selected as one of the Top 5 teams in the Young Entrepreneurs Track held during October 2024, from over 480 applications across 100+ universities and colleges in India. She represented Navmarg Research and Innovation Private Limited, advancing with a project focused on innovative digital solutions for water sustainability.

EnigmaXplore 2.0



Team Cryptonite achieved a remarkable 1st place finish at EnigmaXplore 2.0, a Capture the Flag (CTF) competition hosted by IIIT Nagpur on 24th and 25th October 2024, as part of its annual Tantra Fiesta fest. The event held online drew over 500 participants worldwide, all striving for leaderboard recognition by tackling cybersecurity challenges in cryptography, forensics, and reverse engineering.

IROS'24



Aditya Saha made his remarkable participation in 2024 Underwater Robotics Challenges at IROS'24 Abu Dhabi which was held at Khalifa University, Abu Dhabi, UAE. This achievement underscores a commitment to innovation and technical excellence in a highly specialized field.

GeeksforGeeks



Mr. Siddhan Baranwal (BTech. IT) has been selected as the Campus Ambassador for GeeksforGeeks (GFG) representing Manipal Institute of Technology. This role is a year-long tenure. As the Campus Ambassador, he has the privilege of representing MIT in the GeeksforGeeks community and promoting various opportunities and initiatives offered by GFG.



Research Highlights

Dr. Manohara M M Pai, Mr. Chenchu Saibabu P, Dr. Nikhil Pachauri, and Mr. Nevin Augustine received an industry grant of Rs. 12,74,400 lakhs from Schneider for the project titled "Exploratory Research in Industrial Automation and IoT Intelligent Technologies" under MU Indian Grant.

A research paper titled "Snake swarm optimization-based deep reinforcement learning for resource allocation in edge computing environment," authored by Dr. V. Sivakumar and Dr. S. Kaliraj, has been published in Concurrency Computation Practice and Experience in July 2024.

A research paper titled "Enhancing the Experience and Accessibility of Users with Disability by Integrating Voice Navigation into a Telemedicine Website" by Dr. Divya Rao, Dr. Sucheta Kolekar, and Shreevasta Agnihotri (B.Tech IT, 2022), published in the International Journal of Mathematical, Engineering and Management Sciences in July 2024.

A research paper titled "Energy-Efficient Deviation Aware Adaptive Bit-Mapping Medium Access Control Protocol for Wireless Sensor Network" by Dr. Pankaj Kumar and Dr. Manoj Tolani, published in IEEE Access in July 2024

A research paper titled "KannadaLex: A Lexical Database with Psycholinguistic Information" by Dr. Raghavendra Ganiga, published in ACM Transactions on Asian and Low-Resource Language Information Processing in July 2024.

A research paper titled 'Energy-Efficient Deviation Aware Adaptive Bit-Mapping Medium Access Control Protocol for A research paper titled 'Disaster Assessment from Social Media Using Multimodal Deep Learning' by Dr. Balachandra, Mrs. Jayashree, and Dr. Nisha P. Shetty, published in Multimedia Tools and Applications in July 2024.

A research paper titled 'LivMarX: An Optimized Low-Cost Predictive Model Using Biomarkers for Interpretable Liver Cirrhosis Stage Classification' by Dr. Divya Rao, published in IEEE Access in July 2024.

A research paper titled 'Secure Reviewing and Data Sharing in Scientific Collaboration: Leveraging Blockchain and Zero Trust Architecture' by Dr. Chandrakala C. B. and Ms. Pooja S., published in IEEE Access in July 2024.

A research paper titled 'AOSVM: A Machine Learning Model for Predicting Water Quality in the Cauvery River' by Dr. S. Kaliraj, published in Environmental Research Communications in July 2024.

A research paper titled 'A Compact Highly Flexible Two-Element Wideband MIMO Antenna Based on Modal Analysis for 5G Wireless Applications' by Dr. Sameena Begum Pathan, published in Physica Scripta in July 2024.

A research paper titled 'Dual-Band Compact Six-Element Millimeter Wave MIMO Antenna: Design, Characterization, and Its Application for V2V Communication' by Dr. Sameena Begum Pathan, published in IEEE Access in July 2024.

Dr. Anoop B. N. and team have submitted a project proposal titled "Emerging Trends in Healthcare and Information Security" to the Vision Group on Science and Technology (VGST) under the Faculty Development Program (FDP) scheme.

Dr. Santhosh Kamath and Dr. Anoop B. N. have collaboratively submitted a project proposal titled "Deep Learning-Driven Automated Disease Diagnosis and Quantification Across Multimodal Medical Imaging" to the Vision Group on Science and Technology (VGST) under the Karnataka Fund for Infrastructure Strengthening in Science & Technology (K-FIST L1) program.

A research paper titled "Skin cancer detection through attention guided dual autoencoder approach with extreme learning machine," authored by Dr. Satyajit Mahapatra, has been published in Scientific Reports in August 2024.

A research paper titled "Enhancing the Experience and Accessibility of Users with Disability by Integrating Voice Navigation into a Telemedicine Website," authored by Dr. Sucheta Kolekar and Ms. Divya Rao, has been published in International Journal of Mathematical, Engineering and Management Sciences in August 2024.

A research paper titled "An effective GPU-based random grid secret sharing using an autoencoder image super resolution," authored by Mr. Raviraja Holla M, has been published in Cogent Engineering in August 2024.

A research paper titled "Multimodal Imputation-Based Multimodal Autoencoder Framework for AQI Classification and Prediction of Indian Cities," authored by Mr. Raviraja Holla M, has been published in IEEE Access in August 2024.

A research paper titled "Optimizing Data Retrieval for Enhanced Data Integrity Verification in Cloud Environments," authored by Mr. Akshay K C and Dr. Balachandra and Vikalp Parashar (BTech. IT), has been published in Open Engineering in August 2024.

A research paper titled "Unveiling the Epilepsy Enigma: An Agile and Optimal Machine Learning Approach for Detecting Interictal State from Electroencephalogram Signals," authored by Ms. Diana Olivia, has been published in International Journal of Information Technology (Singapore) in August 2024.

A research paper titled "Enhancing Lane Recognition in Autonomous Vehicles Using Cross-Layer Refinement Network," authored by Pranav Chaudari, Dr. Raghavendra Achar and Dr. Sanjay Singh, has been published in IEEE Access in August 2024.

A research paper titled "Dynamic Twitter Friend Grouping Based on Similarity, Interaction, and Trust to Account for Ever-Evolving Relationships," authored by Dr. Balachandra and Ms. Nisha P Shetty, has been published in IET Communications in August 2024.

A research paper titled "Optimizing Solid Waste Management: A Holistic Approach by Informed Carbon Emission Reduction," authored by Dr. Sumith N, has been published in IEEE Access.

A research paper titled "A defected ground structure based ultracompact wider bandwidth terahertz multiple input multiple output antenna for emerging communication systems," authored by Dr. V. Sivakumar, has been published in Heliyon in September 2024.

A research paper titled "A holistic approach to software fault prediction with dynamic classification," authored by Dr. V. Sivakumar, has been published in Automated Software Engineering in September 2024.

A research paper titled "A quad port dual band notch UWB MIMO antenna using hybrid decoupling structure," authored by Dr. Manohara M M Pai and Ms. Sameena Begum Pathan, has been published in Results in Engineering in September 2024.

A research paper titled "A wideband highly flexible CPW-fed antenna based on characteristic mode analysis for 5G wireless wearable sensor applications," authored by Ms. Sameena Begum Pathan, has been published in Results in Engineering in September 2024.

A research paper titled "Need for an Artificial Intelligence-based Diabetes Care Management System in India and the United States," authored by Ms. Veena Mayya, has been published in Health Services Research and Managerial Epidemiology in September 2024.

A research paper titled "Cross-Lingual Short-Text Semantic Similarity for Kannada–English Language Pair," authored by Dr. Raghavendra Ganiga, has been published in Computers in September 2024.

A research paper titled "Deep Learning Applications in ECG Analysis and Disease Detection: An Investigation Study of Recent Advances," authored by Sumalatha and Dr. Krishna Prakasha K, has been published in IEEE Access in September 2024.

A research paper titled "Deep Learning–Based Enhanced Optimization for Automated Rice Plant Disease Detection and Classification," authored by Dr. S. Kaliraj, has been published in Food and Energy Security in September 2024.

A research paper titled "A Mellin transform based video steganography with improved resistance to deep learning steganalysis for next generation networks," authored by Ms. Manjula C. Belavagi, has been published in MethodsX in September 2024.

A Book Chapter titled Patient Data and Privacy in the Realm of Extended Reality: A Digital Health Perspective, by Dr. Sucheta Kolekar has been published in September 2024.

A research paper titled "Facial Similarity Measure for Recognizing Monozygotic Twins Utilizing 3D Facial Landmarks, Efficient Geodesic Distance Computation, and Machine Learning Algorithms" authored by Dr. Krishna Prakasha K and Ms. Gangotri, has been published in IEEE Access in October 2024.

A research paper titled "Enhancing Healthcare Data Integrity: Fraud Detection Using Unsupervised Learning Techniques," authored by Dr. Balachandra and Ms. Nisha P. Shetty, has been published in the International Journal of Computers and Applications in October 2024.

A research paper titled "EGANet: Edge Guided Attention Network with Label Refinement for Parsing of Animal Body Parts," authored by Dr. Raghavendra S and Dr. Adesh N. D., has been published in IEEE Access in October 2024.

A research paper titled "Optimization Model for Mass Casualty Management System Using QoS-Aware Routing Protocol and Casualty Triage Prediction," authored by Ms. Diana Olivia and Dr. Girija Attigeri, has been published in the International Journal of Information Technology (Singapore) in October 2024.

A research paper titled "Assessing the Effectiveness of MoSCoW Prioritization in Software Development: A Holistic Analysis Across Methodologies," authored by Mr. Raviraja Holla M, has been published in EAI Endorsed Transactions on Internet of Things in October 2024.

A research paper titled "Fine Motor Assessment Using Automated Box and Block Test," authored by Dr. Sucheta Kolekar, has been published in Cogent Engineering in October 2024.

A research paper titled "Optimizing Question Answering Systems in Education: Addressing Domain-Specific Challenges", by Swathi BP, Dr. Girija Attigeri and Shrinithya Halaharvi has been published in IEEE Access in October 2024.

A research paper titled "Empirical Study of Feature Selection Methods in Regression for Large-Scale Healthcare Data: A Case Study on Estimating Dental Expenditures," authored by Dr. Veena Mayya, has been published in the journal IEEE Access in November 2024.

A research paper titled "Single Document Abstractive Text Summarization: A Systematic Literature Review," authored by Mr. Abishek, Dr. Sanjay Singh and Ms. Shivani G Aithal has been published in the journal ACM Computing Surveys in November 2024.

A research paper titled "Drone-Assisted Multi-User Scenario: Composite Relaying and Probability-Based UL/DL Channel Modeling for A2G Links," authored by Dr. Pankaj Kumar, has been published in the journal IEEE Access in November 2024

A research paper titled "FuNet40: Fundus Disease/Abnormality Classification Using Ensemble of Finetuned Pretrained Convolution Models," authored by Dr. Manoj Tolani, has been published in the journal Computer Methods in Biomechanics and Biomedical Engineering: Imaging and Visualization in 2024.

A research paper titled "AFCPACNet: Anchor-Free Crowd Parsing Attention-Based Characteristic Segmentation Network," authored by Dr. Raghavendra S, has been published in the journal IEEE Access in November 2024.

A research paper titled "A Four-Port Flexible UWB MIMO Antenna with Enhanced Isolation for Wearable Applications," authored by Ms. Sameena Begum Pathan, has been published in the journal Results in Engineering in November 2024.

A research paper titled "Enhancing Finger Vein Recognition with Image Preprocessing Techniques and Deep Learning Models," authored by Sumalatha and Dr. Krishna Prakasha K, has been published in the journal IEEE Access in November 2024.

A research paper titled "Transformers and Attention: Decoding and Understanding of Aspect-Based Opinions in User-Generated Contents," authored by Satarupa Biswas and Dr. Poornalatha G, has been published in the journal IEEE Access in November 2024.

A research paper titled "From Geometry to Deep Learning: An Overview of Finger Knuckle Biometrics Recognition Approaches" authored by Sumalatha and Dr. Krishna Prakasha K, has been published in the journal IEEE Access in November 2024.

A research paper titled "The Need for Standards in Evaluating the Quality of Electronic Health Records and Dental Records: A Narrative Review," authored by Dr. Veena Mayya, has been published in the journal Big Data and Cognitive Computing in November 2024.

A research paper titled "Design and Development of Smart AI-Based Voice Assistive Ergonomic Commode Wheelchair for Mobility and Rehabilitation," authored by Ms. Sameena Begum Pathan, has been published in the journal of Instrumentation in November 2024.

Ajitha Shenoy K B has received a grant for a project titled PRAN AI: AI Solutions for Affordable and Accessible Healthcare Across Generations by the Ministry of Education, with a sanctioned amount of ₹81.83 lakhs. Additionally, a patent titled A System and Method for Assessing and Managing Pressure Ulcers has been filed, showcasing innovative strides in healthcare technology.

A research paper titled "SDN-Based Multipath Data Offloading Scheme Using Link Quality Prediction for LTE and WiFi Networks" authored by Dr. Sanjay Singh and Dr. Pankaj Kumar has been published in IEEE Access in January 2024.

A research paper titled "Metasurface Absorber for Millimeter Waves: A Deep Learning Optimized Approach for Enhancing the Isolation of Wideband Dual-Port MIMO Antennas" authored by Dr. Manoj Tolani has been published in Scientific Reports.

A research paper titled "A Machine Learning-Based Clinical Decision Support System for Effective Stratification of Gestational Diabetes Mellitus and Management Through Ayurveda" authored by Mrs. Jayashree and Dr. Nisha P Shetty has been published in the Journal of Ayurveda and Integrative Medicine.

A research paper titled "Boosting Pineapple Maturity Classification: Impact of Data Augmentation and Visual Transformer Integration with Transfer Learning" authored by Mr. Raviraja Holla M has been published in IEEE Access.

A research paper titled "Enhancing Secure Medical Data Communication Through Integration of LSB and DCT for Robust Analysis in Image Steganography" authored by Ms. Ramyashree and Dr. Raghavendra S has been published in IEEE Access.

A research paper titled "Artificial Intelligence-Based Effective Detection of Parkinson's Disease Using Voice Measurements" authored by Dr. G. Pradeep Reddy has been published in Engineering Proceedings.

A research paper titled "Deep and Domain-Specific Feature-Based Cervical Cancer Classification Using Support Vector Machine Optimized with Particle Swarm Optimization" authored by Dr. Satyajit Mahapatra has been published in IEEE Access.

MIT's Vision: Excellence in Technical Education through Research, Innovation and Teamwork.

MIT's 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 Information & Communication Technology

Vision: Excellence in information and communication technology education and research through continuous learning and teamwork.

Mission: To facilitate learners to plan, design and develop information systems aiming at providing solutions for addressing societal requirements, and promoting quality education and research utilizing the expertise of industries, alumni and academia

Program Outcomes for B. Tech.

It enables Students to

• **PO 1: Engineering knowledge:**

Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

• **PO 2: Problem analysis:**

Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

• **PO 3: 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.

• **PO 4: 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.

• **PO 5: Modern tool usage:**

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

• **PO 6: 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.

• **PO 7: 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.

• **PO 8: Ethics:**

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

• **PO 9: Individual and team work:**

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

• **PO 10: 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.

• **PO 11: 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.

• **PO 12: 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.

B. Tech. in Information Technology

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- **PEO 1:** Demonstrate technical competence to work in the knowledge industry
- **PEO 2:** Analyze, design, and provide professional solutions to societal needs
- **PEO 3:** Pursuing higher studies, research in emerging technologies, and demonstrate professional skills
- **PEO 4:** Engage in life-long learning, acquire soft skills & leadership qualities.
- **PEO 5:** Demonstrate sensitivity towards ethics, society, environment and sustainability.

PROGRAM SPECIFIC OUTCOMES (PSOs)

- **PSO 1:** Identify, analyze and develop software systems using appropriate techniques and concepts related to information technology
- **PSO 2:** Analyze and Design algorithms or methods to solve information technology domain problems using analytical, logical and problem-solving skills.
- **PSO 3:** Develop information systems using state-of-the-art IT tools and technologies.
- **PSO 4:** Apply the principles of science, math and computer programming to solve complex problems related to information technology.
- **PSO 5:** Apply knowledge of programming, computational intelligence, computer graphics and visualization, data analytics, software system design, cyber security to arrive at solutions to real world problems.
- **PSO 6:** Apply IT knowledge to design and develop systems with respect to societal, user, customer needs, health and safety, diversity, inclusion, societal, environmental codes of practise and industry standard.
- **PSO 7:** Integrate and interface industry relevant hardware and software components and technology to come up with innovative and creative solutions.
- **PSO 8:** Use of industry standard software tools and platform to design and analyze IT systems.
- **PSO 9:** Learn to function collaboratively as a member of leaders in diverse teams in multidisciplinary settings to manage the process effectively and document, present and communicate with the engineering community.

B. Tech. in Computer & Communication Engineering

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- **PEO 1:** Demonstrate technical competence in Computing and digital Communication
- **PEO 2:** Formulate software solutions for network communication systems
- **PEO 3:** Pursue higher studies, research and development in evolving technologies
- **PEO 4:** Engage in life-long learning, acquire soft skills & leadership quality.
- **PEO 5:** Demonstrate sensitivity towards ethics, society, environment and sustainability.

PROGRAM SPECIFIC OUTCOMES (PSOs)

- **PSO 1:** Analyze and Design algorithms or methods to solve computer and communication engineering problems using analytical, logical and problem solving skills.
- **PSO 2:** Apply soft computing methods to solve communication engineering problems
- **PSO 3:** Develop information systems using state-of-the-art IT tools and technologies.
- **PSO 4:** Develop software for communication domain applying the knowledge of architecture, operating protocols, networks and software tools
- **PSO 5:** Apply the principles of science, maths and computer programming to solve complex problems related to computer and communication technology.
- **PSO 6:** Apply knowledge of programming, computational intelligence, computer graphics and visualization, data analytics, cyber security to arrive at solutions to real world problems.
- **PSO 7:** Apply Computer and communication and IT knowledge to design and develop systems with respect to societal, user, customer needs, health and safety, diversity, inclusion, societal, environmental codes of practise and industry standard.
- **PSO 8:** Integrate and interface industry relevant hardware and software components and technology to come up with innovative and creative solutions.
- **PSO 9:** Use of industry standard software tools and platform to design and analyze computer and communication systems.
- **PSO 9:** Learn to function collaboratively as a member of leader in diverse teams in multidisciplinary settings to manage the process effectively and document, present and communicate with the engineering community.

M. Tech. in Computer Networking & Engineering

PROGRAM OUTCOMES (POs)

- **PO 1:** Independently carry out research investigation and development work to solve practical problems
- **PO 2:** Write and present a substantial technical report/document
- **PO 3:** 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.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- **PEO 1:** Demonstrate technical competence in Computer Network systems and applications
- **PEO 2:** Formulate innovative and feasible software solutions for Network Communication systems
- **PEO 3:** Pursue higher studies and contribute to research and development
- **PEO 4:** Work collaboratively applying the domain knowledge in multi-disciplinary areas and exhibit professional ethics.

PROGRAM SPECIFIC OUTCOMES (PSOs)

- **PSO 1:** Design network hardware architecture and software for wired and wireless communication networks.
- **PSO 2:** Model and Simulate engineering problems using soft computing technologies to analyze and demonstrate the performance.
- **PSO 3:** Apply concepts and processes to develop intelligent and secure systems.
- **PSO 4:** Apply the principles of science, maths and programming to solve complex problems related to computer and networking technology.
- **PSO 5:** Apply knowledge of programming, machine, deep, federated learning, information retrieval to arrive at solutions to real world problems.
- **PSO 6:** Apply Computer Networking knowledge to design and develop systems with respect to societal, user, customer needs, health and safety, diversity, inclusion, societal, environmental codes of practise and industry standard.
- **PSO 7:** Integrate and interface industry relevant hardware and software components and technology to come up with innovative and creative solutions
- **PSO 8:** Use of industry standard software tools and platform to design and analyze computer networking systems.
- **PSO 9:** Learn to function collaboratively as a member of leader in diverse teams in multidisciplinary settings to manage the process effectively and document, present and communicate with the engineering community.

M. Tech. in Artificial Intelligence & Decision Science

PROGRAM OUTCOMES (POs)

- **PO 1:** Independently carry out research /investigation and development work to solve practical problems
- **PO 2:** Write and present a substantial technical report/document
- **PO 3:** 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.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- **PEO 1:** Demonstrate technical competence in intelligent system development.
- **PEO 2:** Analyze and design optimal intelligent solutions for societal problems.
- **PEO 3:** Collaborate in interdisciplinary projects and exhibit professional ethics.
- **PEO 4:** Pursue lifelong learning in generating innovative engineering solutions using research and complex problem-solving skill

PROGRAM SPECIFIC OUTCOMES (PSOs)

- **PSO 1:** Design intelligent systems by applying engineering principles and practices to provide solutions to complex engineering problems.
- **PSO 2:** Provide automation/software solution for societal problems.
- **PSO 3:** Ability to use the tools, and techniques for developing decisive, and intelligent solutions.
- **PSO 4:** Apply the principles of science, math and programming to solve complex problems related to machine intelligence and decision science.
- **PSO 5:** Apply knowledge of programming, full stack development, federated learning, semantic web to arrive at solutions to real world problems.
- **PSO 6:** Apply Artificial intelligence and decision system knowledge to design and develop systems with respect to societal, user, customer needs, health and safety, diversity, inclusion, societal, environmental codes of practise and industry standard.
- **PSO 7:** Integrate and interface industry relevant hardware and software components and technology to come up with innovative and creative solutions.
- **PSO 8:** Use of industry standard software tools and platform to design and analyze machine intelligent and decision science problems.
- **PSO 9:** Learn to function collaboratively as a member of leader in diverse teams in multidisciplinary settings to manage the process effectively and document, present and communicate with the engineering community.