



MANGALORE INSTITUTE OF TECHNOLOGY & ENGINEERING

(A Unit of Rajalaxmi Education Trust®, Mangalore)

Autonomous Institute affiliated to VTU, Belagavi, Approved by AICTE, New Delhi

Accredited by NAAC with A+ Grade & ISO 9001:2015 Certified Institution

Department of Robotics and Artificial Intelligence

Robotics and AI Student Explorers (RAISE)



ANNUAL REPORT

Academic-Year 2025-26



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DEPARTMENT OF ROBOTICS AND ARTIFICIAL INTELLIGENCE

Preamble

The Department of Robotics and Artificial Intelligence at Mangalore Institute of Technology & Engineering (MITE), Moodabidri, is committed to fostering innovation, technical excellence, and holistic development among students through a vibrant and interdisciplinary learning environment. The B.E. program in Robotics and Artificial Intelligence, introduced in the academic year 2024–25 with an intake of 60 students, is designed to equip students with the knowledge and skills required to develop intelligent, autonomous, and socially responsible robotic systems. The program integrates fundamental engineering principles with emerging technologies such as robotics, automation, machine learning, computer vision, control systems, sensor technology, and intelligent systems, with a strong emphasis on practical learning, innovation, and real-world applications.

RAISE (Robotics and AI Student Explorers) is the official student forum of the Department of Robotics and Artificial Intelligence, established on 27th September 2025. RAISE serves as a dynamic platform that encourages students to explore their interests beyond the regular academic curriculum and develop their technical, creative, leadership, communication, and problem-solving abilities. The forum provides opportunities for students to collaborate, experiment, innovate, and transform ideas into practical solutions through a wide range of student-driven activities. RAISE organizes various technical and academic enrichment activities, including expert lectures, technical talks, hands-on workshops, and innovation-oriented events. These activities provide students with exposure to emerging developments in robotics, artificial intelligence, automation, machine learning, computer vision, autonomous systems, and related interdisciplinary domains. The forum also encourages participation in national- and intercollegiate-level competitions, enabling students to gain valuable experience, interact with peers from different institutions, and demonstrate their technical capabilities.

A key objective of RAISE is to promote experiential learning and student-led innovation. The forum encourages students to undertake projects, develop prototypes, participate in research-oriented activities, and explore emerging technologies beyond the prescribed curriculum. Through mentorship, collaborative projects, and interaction with experts from academia and industry, students are encouraged to identify real-world problems and develop innovative technological solutions. The forum also provides opportunities to recognize and celebrate student achievements in academics, technical competitions, innovation, research, extracurricular activities, and other areas of excellence. By acknowledging student accomplishments, RAISE motivates learners to pursue continuous improvement and actively contribute to the growth of the department.

Through its diverse range of activities, RAISE aims to create a collaborative ecosystem where students can explore their interests, exchange ideas, develop practical skills, and work together to address contemporary technological and societal challenges. Guided by its vision to **“Explore, Innovate, and Transform,”** The forum ultimately seeks to empower students to become capable innovators who can contribute meaningfully to sustainable, inclusive, and intelligent technological ecosystems.



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List of Hands-on Workshops, Technical Talks, Competitions and Exposure Visits

Conducted under RAISE

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Activity-1

Title: Expert Talk on “Applications of Robotics and Artificial Intelligence in Healthcare”

Resource Person: Dr. Dinesh M.S.

Group Lead, Clinical Informatics – Advanced Development and AI, Philips Enterprise Informatics

Date: 27/09/2025

About the Resource Person

Dr. Dinesh M.S. is a professional working in the domain of Clinical Informatics and Artificial Intelligence. He is associated with Philips Enterprise Informatics as Group Lead – Clinical Informatics, Advanced Development and AI. His professional interests include the application of artificial intelligence, medical imaging, clinical decision support and intelligent technologies in healthcare. He has also been associated with academic and professional advisory activities in the areas of medical and healthcare technology.

About the Event

The Department of Robotics and Artificial Intelligence organized an expert talk on “**Applications of Robotics and Artificial Intelligence in Healthcare**” on 27th September 2025. The session was delivered by Dr. Dinesh M.S., Group Lead, Clinical Informatics–Advanced Development and AI, Philips Enterprise Informatics. The session provided students with valuable insights into the application of emerging technologies in modern healthcare and their role in improving patient outcomes. The resource person explained the integration of Robotics and Artificial Intelligence in healthcare, with emphasis on diagnostic accuracy, treatment planning and clinical decision-making. Students were introduced to the use of machine learning and deep learning techniques for analysing medical images such as X-rays, CT scans and MRI scans, supporting early disease detection and diagnosis.

The session also highlighted AI-driven predictive analytics, where intelligent systems can analyse large volumes of patient data to predict disease progression, identify potential health risks and

support personalized treatment strategies. Clinical decision-support systems and their role in providing evidence-based recommendations were also discussed.

An important aspect of the session was the discussion on **data privacy, ethical use of AI, transparency and regulatory considerations** in healthcare technologies. Students actively interacted with the resource person and sought information regarding research opportunities, industrial applications and career prospects in healthcare robotics and AI. The session broadened students' understanding of how intelligent technologies can contribute to smarter, safer and more accessible healthcare solutions.



Figure 1: Dr. Dinesh M.S. delivering the expert talk on Applications of Robotics and Artificial Intelligence in Healthcare.



Activity-2

Title: Two-Day Hands-on Workshop on “Intelligent Motion: A Hands-on Journey through Robotic Modeling and Simulation”

Resource Person: Dr. Ankur Jaiswal

Associate Professor, Department of Mechatronics, Manipal Institute of Technology, Manipal

Date: 27/10/2025 and 28/10/2025

About the Resource Person

Dr. Ankur Jaiswal is an Associate Professor in the Department of Mechatronics at Manipal Institute of Technology, Manipal. He holds B.Tech., M.Tech. and Ph.D. qualifications. His areas of expertise include kinematics and dynamics of serial and parallel robots, mechanisms, robotics, mechanical design, optimization, product development and simulation. His research interests also include robotics, industrial automation, smart manufacturing, FEM and AI-based applications.

About the Event

The Department of Robotics and Artificial Intelligence organized a two-day hands-on workshop titled “Intelligent Motion: A Hands-on Journey through Robotic Modeling and Simulation” on 27th and 28th October 2025. The workshop was conducted by Dr. Ankur Jaiswal, Associate Professor, Department of Mechatronics, MIT Manipal, with the objective of providing students with practical exposure to robotic modelling, motion planning and simulation techniques used in modern automation systems.

The workshop commenced with an overview of robotics in Industry 4.0, smart manufacturing and autonomous systems. The importance of robotic modelling and simulation in designing, validating and optimizing robotic systems before physical implementation was emphasized. On the first day, students were introduced to robotic manipulators, links, joints, actuators, end effectors and sensors.

Fundamental concepts such as Degrees of Freedom, coordinate transformations, homogeneous transformation matrices and Denavit-Hartenberg parameters were covered.

Students learned Forward and Inverse Kinematics along with workspace analysis, singularities and trajectory planning. Hands-on sessions using **RoboAnalyzer** and **RoboStudio** enabled participants to model robotic manipulators, visualize kinematic chains, analyse workspaces and simulate robotic trajectories. The second day focused on advanced simulation and industrial applications. Participants explored robot path planning, collision detection, cycle-time optimization and motion verification. They developed simulation models for industrial tasks such as pick-and-place, material handling and assembly-line automation. The sessions also introduced digital twins, virtual commissioning and simulation-driven engineering in modern manufacturing. The workshop provided students with practical exposure to robotic kinematics, motion analysis, path planning and industrial simulation. It strengthened their ability to analyse robotic behaviour, solve simulation-based problems and apply engineering principles to automation and robotics applications.



Figure 2: Hands-on session on robotic modelling and simulation using RoboAnalyzer and RoboStudio.



Figure 3: Dr. Ankur Jaiswal conducting the workshop on Robotic Modeling and Simulation.



Activity-3

Title: Two-Day Hands-on Workshop on “Additive Manufacturing and Process Optimization for Robotic Applications”

Resource Persons: Dr. Aveen K.P. and Dr. Adithya Hegde

Assistant Professors, Department of Robotics and Artificial Intelligence, MITE

Date: 09/12/2025 and 10/12/2025

About the Resource Persons

Dr. Aveen K.P. is a Senior Assistant Professor at MITE. He holds a Ph.D. in Mechanical Engineering, an M.Tech. in Manufacturing Science and Engineering and a B.E. in Mechanical Engineering. His areas of expertise include Artificial Intelligence and Generative AI, Robotics and Automation, Additive Manufacturing, Composite Materials and CNC/CAD-CAM. His research work includes additive manufacturing, 3D printing, composite materials and advanced manufacturing processes.

Dr. Adithya Hegde is an Assistant Professor in the Department of Robotics and Artificial Intelligence at MITE. He holds a Ph.D. in Mechanical Engineering and an M.Tech. in Manufacturing Science and Engineering. His areas of interest include materials design and characterization, composite materials, mechanical testing, advanced manufacturing, additive manufacturing, design of experiments, artificial neural networks and R&D project management.

About the Event

The Department of Robotics and Artificial Intelligence organized a two-day hands-on workshop titled “**Additive Manufacturing and Process Optimization for Robotic Applications**” on 9th and 10th December 2025. The workshop was conducted by Dr. Aveen K.P. and Dr. Adithya Hegde with the objective of providing students with practical exposure to the complete additive

manufacturing workflow, beginning with computer-aided design and extending to fabrication of functional prototypes for robotic applications.

The first day focused on additive manufacturing fundamentals and FDM-based 3D printing. Students were introduced to additive manufacturing technologies, rapid prototyping materials and applications in robotics, automation, healthcare, automotive engineering, product development and aerospace. Participants received hands-on training in **Fusion 360** for developing three-dimensional parametric models.

Students designed robotic components and functional prototypes and converted their models into STL files for additive manufacturing. Design for Additive Manufacturing principles such as minimum wall thickness, overhang limitations, support requirements and part orientation were discussed. Students were also guided in identifying and correcting modelling errors and optimizing designs for material efficiency, strength and printability.

The second day concentrated on slicing, process optimization and 3D printing using **PrusaSlicer**. Students explored the influence of layer height, infill density, shell thickness, print speed, support structures, build orientation and temperature on print quality, build time and material consumption. They generated optimized slicing profiles, analysed toolpaths and estimated printing time and material usage before generating G-code.

The workshop provided end-to-end practical exposure to CAD modelling, STL generation, slicing, process parameter optimization and FDM-based prototype fabrication. It strengthened students' skills in digital design, process planning, rapid prototyping and advanced manufacturing technologies relevant to robotics and intelligent systems.



Figure 4: Resource persons demonstrating CAD modelling and additive manufacturing concepts.

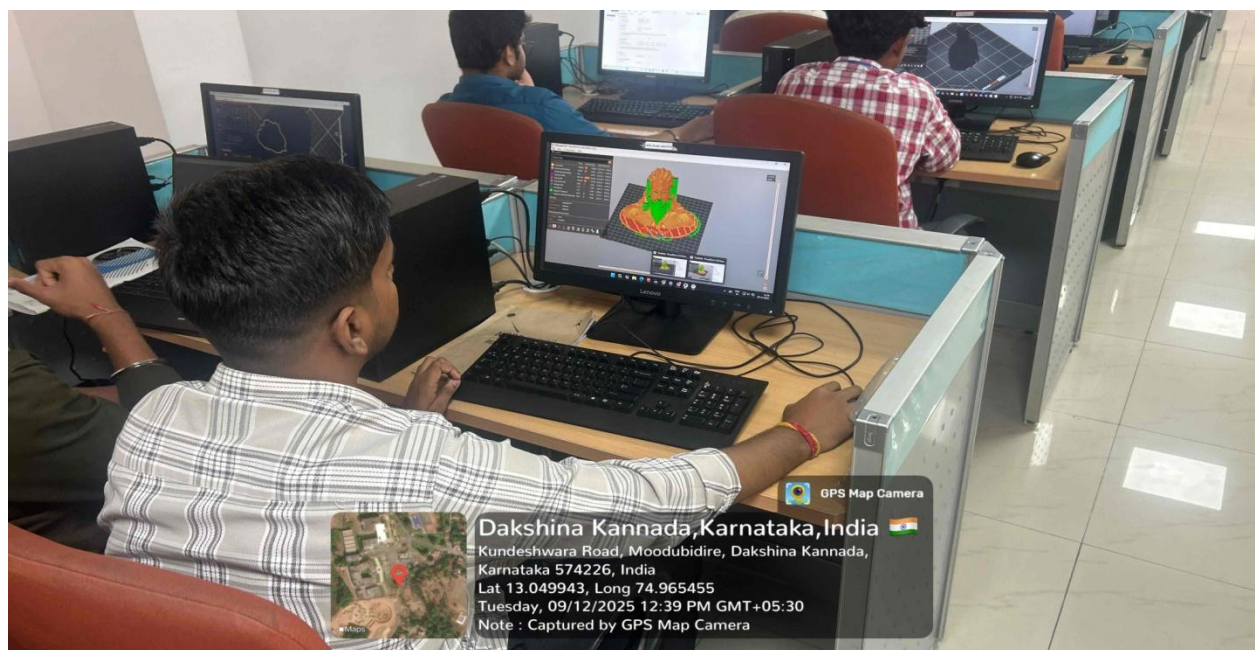


Figure 5: Students working on 3D modelling, slicing and prototype development.



Figure 6: Hands-on demonstration of FDM-based 3D printing.



Activity-4

Title: Two-Day Workshop on “Smart Factory Automation using PLC & Factory I/O”

Resource Person: Mr. Bharath T.S.

Director, iRobo Automation Pvt. Ltd.

Date: 06/04/2026 and 07/04/2026

About the Resource Person

Mr. Bharath T.S. is the Director of iRobo Automation Pvt. Ltd. and an industry professional specializing in automation technologies and industrial control systems. His professional expertise includes PLC programming, industrial system integration and smart factory solutions. His experience in implementing real-time automation systems provided students with valuable exposure to industrial automation practices and workflows.

About the Event

The MITE Innovation and Incubation Center, in association with the Department of Robotics and Artificial Intelligence, organized a two-day hands-on workshop on “**Smart Factory Automation using PLC & Factory I/O**” on 6th and 7th April 2026. The workshop provided students with practical exposure to Industry 4.0, programmable logic controllers, virtual factory simulation and intelligent manufacturing systems. A total of 56 RAI students participated in the program.

The first day introduced students to Industry 4.0, cyber-physical systems, digital manufacturing and industrial automation. Participants were trained in the Factory I/O simulation environment and learned I/O mapping, sensors, actuators, start-stop circuits, emergency-stop logic, latching circuits and conveyor automation. They developed conveyor-based material-handling systems and implemented object detection using proximity and photoelectric sensors.

The second day focused on **Bosch Rexroth PLC integration** and ladder-logic programming using IndraLogic and the IndraWorks Engineering Suite. Students worked with normally open and normally closed contacts, coils, timers, counters and memory functions. They integrated the PLC with Factory I/O and developed automation projects involving conveyor sequencing, object detection, product counting, sorting and material handling.

The workshop provided valuable industry-oriented exposure to PLC programming, virtual commissioning, industrial automation and smart manufacturing. It helped students understand how control logic can be developed, tested and integrated with virtual industrial systems before implementation in real manufacturing environments.



Figure 7: Mr. Bharath T.S. conducting the hands-on session on Smart Factory Automation.



Figure 8: Students developing automation systems using Factory I/O and PLC programming.



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Activity-5

Title: Two-Day Workshop on “Practical Approaches to Finite Element Modeling”

Resource Person: Dr. Harish Kumar, Assistant Professor MIT Manipal

Date: 25/05/2026 and 26/05/2026

About the Resource Person

Dr. Harish Kumar is a **Design Engineer** associated with **Manipal Institute of Technology (MIT), Manipal**. He holds an **M.Tech degree** and possesses expertise in engineering design and related technical applications. His academic and professional experience includes design, analysis, development, and application-oriented engineering solutions. With a strong technical background and research-oriented approach, Dr. Harish Kumar contributes to engineering innovation and the development of practical solutions to complex engineering challenges. simulation.

About the Event

The Department of Robotics and Artificial Intelligence, in association with the ISTE MITE Chapter, organized a two-day workshop titled **“Practical Approaches to Finite Element Modeling”** on 25th and 26th May 2026 at the Innovation Lab, MITE. The workshop was designed to provide students with a strong foundation in Finite Element Analysis and exposure to engineering simulation tools used for design validation, structural analysis and product development. A total of 57 fourth-semester RAI students participated in the program.

The first day introduced students to the theoretical foundations of the Finite Element Method. Important concepts such as discretization, meshing, nodes, elements, degrees of freedom, shape functions, stiffness matrices and boundary conditions were discussed. Students were given hands-on exposure to node and element creation, geometry development, material-property assignment and mesh generation.

Participants developed basic structural components and learned preprocessing operations such as defining element types, assigning material properties, generating meshes and applying constraints. The importance of mesh quality and model preparation in achieving accurate simulation results was emphasized. Students also explored the influence of element size and mesh density on accuracy and computational efficiency.

The second day focused on structural analysis and interpretation of simulation results. Students applied external loads and boundary conditions and learned how simulation solvers determine displacement, stress, strain and reaction forces. The workshop enhanced students' understanding of computational mechanics, structural simulation, model creation, meshing, load application and interpretation of engineering results.

The workshop strengthened students' analytical and problem-solving skills and provided industry-relevant exposure to simulation-driven design. It also demonstrated how finite element analysis can support design validation, optimization, structural assessment and multidisciplinary engineering applications.



Figure 9: Dr. Harish Kumar conducting the session on Finite Element Modeling.



Figure 10: Students performing hands-on finite element modelling and simulation.



Activity-6

Title: AICTE Activity Point Program – “Project Exhibition at Karnataka Public School, Mijar”

Date: 18/12/2025

About the Event

The Department of Robotics and Artificial Intelligence, Mangalore Institute of Technology & Engineering, organized and participated in a **Project Exhibition at Karnataka Public School, Mijar**, on 18th December 2025 as part of the AICTE Activity Point initiatives. The activity was aimed at promoting technical awareness among school students while providing RAI students with an opportunity to demonstrate their projects and practical engineering skills.

A total of **57 third-semester RAI students** participated in the exhibition and presented working models and prototypes developed through academic and extracurricular activities. The exhibits demonstrated concepts related to robotics, automation, embedded systems and intelligent technologies. Projects included Arduino-based systems, fire-detection alarm systems and sensor-based automation models.

Students explained the working principles, components and applications of their projects to school students and teachers. The interactive demonstrations generated interest among the participants and provided an opportunity for knowledge sharing and technical outreach. The activity also helped RAI students develop communication, project-presentation and teamwork skills while contributing to community engagement under the AICTE Activity Point framework.



Figure 11: RAI students demonstrating robotics and automation projects at Karnataka Public School, Mijar.



Figure 12: Students interacting with school students during the project exhibition.



Activity-7

Title: AICTE Activity Point Program – “Facilitating 100% Digitized Money Transactions”

Date: 14/05/2026 to 31/05/2026

About the Event

The Department of Robotics and Artificial Intelligence conducted an awareness activity titled **“Facilitating 100% Digitized Money Transactions”** from 14th May 2026 to 31st May 2026 as part of the AICTE Activity Point initiative. The activity focused on promoting digital payment practices and creating awareness among the public about secure, efficient and cashless financial transactions.

As part of the initiative, students interacted with local vendors, shopkeepers and community members and demonstrated the use of UPI-based payment applications and other digital transaction platforms. They explained the benefits of digital payments, including convenience, transparency, reduced transaction time and improved financial inclusion.

The activity provided students with an opportunity to engage directly with the community and understand practical challenges associated with digital adoption. Students participated individually or in teams and documented their activities through geo-tagged photographs, reports and participation records.

The initiative enhanced students' **communication, leadership, teamwork and social responsibility skills** while creating awareness about secure and effective digital transaction systems. The activity served as a meaningful community-engagement initiative under the AICTE Activity Point scheme and contributed to the broader objective of promoting digital empowerment.



Figure 13: RAI students creating awareness about digital payment methods among community members.