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A Report on Guest Lecture titled "Trends in Robotics: Theories and Implementation" Organized by Department of Mechanical Engineering on 04.09.2025.

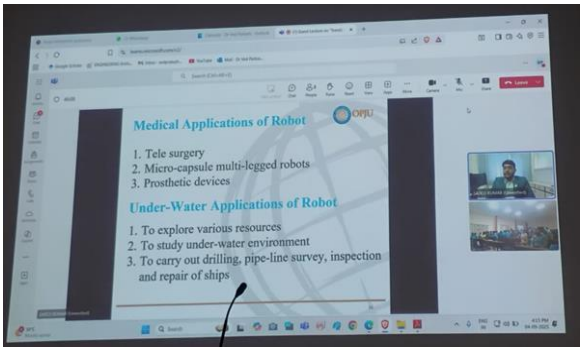
Event Coordinators: Dr. Ved Prakash, Dr. Gejendhiran S, Assistant Professors, Dept. of Mechanical Engineering, MITS, Madanapalle.
Resource Person Details: Dr. Saroj Kumar, Associate Professor, Centre Head-Centre of Excellence Robotics & Drone Technology, O.P. Jindal University, Chhattisgarh, India.
Venue: Seminar Hall D
Date: 04.09.2025 Time: 4.00 PM
Mode of Conduct: Offline
Report Received on 10.10.2025.

Overview

The field of robotics is undergoing rapid transformation with the convergence of Artificial Intelligence (AI), Machine Learning (ML), Internet of Things (IoT), and Drone Technology. To provide students with insights into the latest research and industrial practices, the Department of Mechanical Engineering at MITS, in collaboration with the ISTE Student Chapter, organized a guest lecture titled "Trends in Robotics: Theories and Implementation." The lecture aimed to bridge theoretical concepts with real-world applications, inspiring participants to explore innovation and research opportunities in this multidisciplinary domain.

The event began with Dr. Gejendhiran, Assistant Professor of Mechanical Engineering, who acted as the Master of Ceremony (MC) and set the tone for the session. Following this, Dr. Ved Prakash, Assistant Professor of Mechanical Engineering, introduced the event and highlighted its objectives.

Dr. S. Baskaran, Associate Professor & Head of the Department of Mechanical Engineering, extended a warm welcome to the gathering and emphasized the importance of exposing students to emerging trends in robotics. Later, Dr. Arun I, Professor of Mechanical Engineering, addressed the audience and motivated students to leverage such opportunities for academic and professional growth. The technical session was then taken over by the resource person, Dr. Saroj Kumar, who delivered an insightful lecture on the evolving trends in robotics. He explained the integration of AI, ML, IoT, and drone technology in modern robotic systems, making them more intelligent, autonomous, and efficient. A major highlight of his session was on drones, where Dr. Kumar provided a comprehensive explanation of their design, functionality, and applications. He described the key parts of drones, such as:



1. Frame – structural skeleton ensuring aerodynamics and stability.
2. Propellers – generate lift and thrust for flight and maneuverability.
3. Motors & Electronic Speed Controllers (ESCs) – deliver rotational force and regulate propeller speed.
4. Flight Controller – the "brain" of the drone, processing sensor inputs for stable flight.
5. GPS Module – provides accurate navigation and autonomous flight capability.
6. Sensors (gyroscope, accelerometer, altimeter, LiDAR, infrared, etc.) – support orientation, altitude control, obstacle detection, and mapping.
7. Camera & Payload Systems – enable aerial imaging, surveillance, and carrying specialized tools.
8. Battery & Power Distribution Board – supply energy to motors and electronic components.

He further explained how AI and ML algorithms allow drones to process data, perform real-time object detection, and make autonomous decisions, while IoT integration enables live data sharing and remote monitoring. Dr. Kumar elaborated on drone applications across multiple domains, including:

1. Agriculture: precision farming, crop health monitoring, irrigation planning, and automated spraying.
2. Healthcare: delivering medicines, vaccines, and emergency medical kits to remote or disaster-hit areas.
3. Defense & Security: border surveillance, reconnaissance, and tactical military support.
4. Disaster Management: rapid disaster mapping, search-and-rescue operations, and monitoring inaccessible zones.
5. Industrial Inspection: monitoring oil rigs, pipelines, wind turbines, and power lines.
6. Logistics & Transportation: last-mile delivery services and experimental cargo transportation.
7. Environmental Monitoring: wildlife tracking, forest surveying, pollution monitoring, and climate studies.

Through these insights, Dr. Kumar highlighted how drones are evolving from simple flying devices into intelligent, multi-purpose platforms that are reshaping industries and contributing to societal advancement. The session was highly interactive, with students raising questions about drone technologies and robotics applications. Around 70 students participated in the event and benefitted from the expert's knowledge and real-world case studies.

The program concluded with a formal vote of thanks, acknowledging the resource person, dignitaries, and participants for making the event a success.

Outcome of the Guest Lecture

1. Students gained a comprehensive understanding of drone parts, AI/ML/IoT integration, and robotics applications.
2. Learned about emerging trends in robotics and their real-world impact across industries.
3. Recognized the scope of drones in agriculture, defense, healthcare, and environmental monitoring.
4. Motivated to pursue research, interdisciplinary projects, and innovation in robotics and drone technology.

Summary

The guest lecture on "Trends in Robotics: Theories and Implementation" by Dr. Saroj Kumar offered participants a rich exposure to the synergy of robotics, AI, ML, IoT, and drone technology. The session not only covered the technical components and design aspects of drones but also expanded into their diverse industrial and societal applications. With active participation from 70 students, the event successfully achieved its objective of bridging theoretical learning with practical insights, inspiring the audience to explore emerging opportunities in robotics and automation.