Indian Institute of Technology Patna
Department of Mechanical Engineering

Faculty Development Programme

on

Mobile Robotics - Elementary

June 16-20, 2021

Coordinator:

Dr. Atul Thakur, ME, IIT Patna

Resource person:

- **Dr. Atul Thakur, IIT Patna**
- **Dr. Raju Halder, IIT Patna**
- **Dr. Satyandra K. Gupta, University of Sourthern California**
- **Dr. Lalit Singh, NPCIL, BARC**

Course Description and Content

Mobile robots are now enabling human beings to physically reach and explore unchartered territories in the Universe. Be a place as distant as Mars, in abysmal depths of ocean, or shrouded by thick glaciers of Antarctic, mobile robots help exploring everything; yet this is just the beginning. Even in day to day life autonomous cars hold a potential to revolutionize transportation and domestic mobile robots help humans in cleaning, elderly help, etc. National defense is an area replete with the use of mobile robots. This course will present various aspects of design, motion planning, and control of intelligent mobile robotic systems. The key highlights of the course are:

- **Bio-inspired robot locomotion**
- **Kinematics of mobile robots**
- **Sensing and perception in mobile robot**
- **Robot localization algorithms**
- **Robot motion planning algorithms**
- **Robot Operating System (ROS)**
- **Practical case studies of mobile robotics**

Broad Scope

The main objective of this course is to provide exposure to the current status and next-generation innovations of mobile robotics. The topics will focus on basics, advances, and applications to benefit different people from academic & research communities associated with the disciplines of Mechanical, Electrical, Electronics, Computer Science, etc.

Target Audience

The course is suitable for third and fourth year of undergraduate engineering programs as well as Ph.D. students, Scientists in R&D organizations, Faculty Members, and professionals interested in the area of Mobile Robotics.

Schedule

Date	Session 1 09:00am - 10:30am	Session 2 11:00am - 12:30am	Session 3 03:00pm - 05:00pm
June 16	Introduction to Mobile Robotics	Bio-inspired robotics	Tutorial on CoppeliaSim
June 17	Kinematics of mobile robots	Sensors and Actuators	Tutorial on Matlab based kinematic simulation
June 18	Aerial Robotics	Robot Localization	Tutorial on ROS-based Robot Programming
June 19	Robot Path Planning Algorithms	Mathematical modelling for Safety analysis of Mechatronics systems	Tutorial on Image Processing for Mobile Robotics
June 20	Underwater Robotics Research	Yoga and Academic Life	Valedictory and Feedback

Contact:

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