

Karyashala
(High End Workshop)
on

Control of Autonomous Mobile Robot: From Theory to Practice



Funded By

Science & Engineering Research Board (SERB)
under the Accelerate Vigyan Scheme

Govt. of India

16th January – 22nd January 2023

Coordinator

Dr. Manas Kumar Bera



Organized By

Department of Electronics and Instrumentation
Engineering

National Institute of Technology Silchar

Silchar-788010

Assam, India

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INTRODUCTION

The two-wheeled differential-drive mobile robot has a large domain of applications, where they work as a single entity or as a formation. These applications require tracking a trajectory in uncertain environments, path following, and obstacle avoidance, which is certainly challenging to perform in real-time. Due to the wide range of applications, it is essential to understand the fundamentals of the wheeled mobile robots, learn about techniques to achieve navigation and explore advanced controllers which can achieve the required motion control. Also, it is important to learn about state-of-the-art simulation software like ROS and MATLAB for the purpose of deployment and practice.

OBJECTIVES

- To learn the fundamentals of autonomous mobile robots and their applications in various areas such as agriculture, space mission and surveillance.
- To understand the kinematic and dynamic modelling of wheeled mobile robots with simulation and practical deployment.
- Familiarization with the different strategies for robot navigation and path planning.
- To design advanced control techniques for motion control of the mobile robot.
- Hands-on training on ROS and MATLAB/Simulink for control of the mobile robot.

WHO CAN APPLY

PhD and PG students from various engineering disciplines (preferably EE, ME, EIE, ECE and CSE).

REGISTRATION & CERTIFICATION

- There is no registration fees.
- Number of participants is limited to 25.
- Interested candidates can register by filling the online registration form.
<https://forms.gle/F9c7nueLsM5CipBJA>
- Certificate will be provided to the active participants.
- Accommodation with food will be provided to the selected participants. TA for the journey will be provided as per the SERB norms (Sleeper Class, Train Fare).

IMPORTANT DATES

- Last date for online registration: 20th December 2022
- Date of confirmation to participants 25th December 2022
- Duration of workshop: 16th – 22nd January 2023



CONTACT DETAILS

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National Institute of Technology Silchar

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ABOUT NIT SILCHAR

National Institute of Technology Silchar is one of the 31 National Institutes of Technology of India and was established in 1967 as a Regional Engineering College Silchar in Assam. In 2002, it was upgraded to the status of National Institute of Technology and was declared as Institute of National Importance under the National Institutes of Technology Act, 2007. NIT Silchar is a fully residential campus situated on the banks of river Barak and on a sprawling green campus spread over 625 acres of land surrounded by scenic tea gardens on the outskirts of Silchar. NIT Silchar is a teaching and research institute which reflects in the top NIRF ranking. NIT Silchar has been ranked internationally by the highly reputed Times Higher Education (THE) World University Ranking 2023 with a rank in the band of 601-800. In the QS Asia University Ranking, it is ranked in the band 401-450. In 2022 NIRF ranking, NIT Silchar secured 38th rank in engineering, 50th in Research Institutions and 76th in overall category.

ABOUT DEPARTMENT

The Department of Electronics & Instrumentation Engineering was established in the year of 2008 and currently offers a four year B.Tech. programme in Electronics & Instrumentation Engineering, M.Tech. in Instrumentation Engineering and Ph.D. in the related areas. The department is having state of the art laboratory facilities and is equipped with all the latest equipment that will allow us to investigate and research any new methods in the domain of Instrumentation and Control. The robotics lab is equipped with mobile robots like Qbot, FireBird V etc., facilitating research to implement control and path-planning algorithms.

RESOURCE PERSONS

Highly qualified and experienced faculties from various reputed institutes (IITs, NITs, IIITs etc.) and industry experts.

- Prof. Asokan Thondiyath, Professor, Department of Engineering Design, IIT Madras.
- Dr. Santhakumar Mohan, Associate Professor, Department of Mechanical Engineering, IIT Palakkad.
- Dr. Parijat Bhowmick, Assistant Professor, Department of Electronics and Electrical Engineering, IIT Guwahati.
- Dr. Kiran Kumari, Assistant Professor, Department of Electrical Engineering, IISc Bangalore
- Dr Aseem V Borkar, Engineering Manager, Technology Innovation Hub for IoT and IoE (TIH-IoT), IIT Bombay.
- Mr. Pradyum Aadith S, System Integration Engineer, Nugenix Robotics., Coimbatore.
- Dr. Yogesh Singh, Assistant Professor, Department of Mechanical Engineering, NIT Silchar.
- Dr. Manas Kumar Bera, Assistant Professor, Department of Electronics and Instrumentation Engineering, NIT Silchar..

CHIEF PATRON

Prof. Rajat Gupta,
Director, NIT Silchar

PATRON

Prof. N. B. Dev Choudhury, Dean R&C, NIT Silchar

COORDINATOR

Dr Manas Kumar Bera
Head & Assistant Professor, Dept. of E&I Engineering

ORGANIZING COMMITTEE MEMBERS

Dr. S. H. Laskar, Dr. R. Dasgupta, Dr. L. Seban, Dr. J. Hazarika, Dr. S. Sahoo, Dr. M. Khanra, Dr. A. K. Sunaniya, Dr. R. Hazra, Dr. K. Mukherjee, Dr. Shankar. K., Dr. S. Chakraborty, Dr. A. K. Sharma, Dr. V. C. Pal, Dr. Pravin PS



Mobile Robots available for research at NIT Silchar



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Technology Silchar, Silchar-788010, Assam, India**

Name of the Participant: _____

Department: _____

Gender: _____

Pursuing Degree: MS/ M.Tech/ M.E / Ph.D.

Semester: _____

Organization: _____

Mobile No. _____

Email: _____

I agree to abide by the rules and the regulations governing the Workshop.

Signature of the Participant

Place:

Date:

Mr./Ms. _____ is a student of our Institution and
is permitted to attend the programme.

Signature of the Head of Department and Seal

Place:

Date: