

Online Faculty Development Program
On
Advances in Robotics and Machine Learning
ARML-2025

Under the banner of
Electronics and ICT academy at National Institute
of Technology Patna

10th Feb to 14th Feb, 2025



Patron
Prof. P. K. Jain
Director, NIT Patna

Convenor
Prof. R. K. Mandal
Head, Electrical Engineering Department, NIT
Patna

Coordinators
Dr. Arunangshu Ghosh
Dr. Gagan Deep Meena
Dept. of Electrical Engineering,
NIT Patna

Organized by
Electronics and ICT Academy, National Institute of
Technology Patna, Patna- 800005. India.
<https://nitp-ict.ct.ws/>

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About NIT Patna

National Institute of Technology Patna is the 18th National Institute of Technology created by the Ministry of H.R.D. Government of India after rechristening the erstwhile Bihar College of Engineering Patna on 28.01.2004. NIT Patna marked its humble beginning in 1886 with the establishment of pleader's survey training school which was subsequently promoted to Bihar College of Engineering Patna in 1924. This made this institute the 6th oldest Engineering Institute of India. The Institute is situated on the south bank of holy river Ganges behind Gandhi Ghat (where the ashes of father of the Nation, Mahatma Gandhi was offered in the river Ganges). The campus has a picturesque river view with historic buildings presenting a spectacle of architectural delight and natural beauty. The Institute imparts high level education training, research and development in science, engineering technology and humanities along with high quality education and values at UG, PG and Ph.D. level. At present the Institute offers courses in six major technical disciplines viz. Architecture, Civil Engineering, Computer Science & Engg., Electrical Engg., Electronics & Communication Engg. And Mechanical Engg. It also consists of well-established departments of Physics, Chemistry, Mathematics and Humanities and Social Sciences.

Electronics and ICT Academy

The Ministry of Electronics and Information Technology, Government of India has instituted seven Electronics and Information & Communications Technology (ICT) Academies of which, the academy of NIT Patna is one. The Academy at NIT Patna aims to design and organize basic as well as specialized training programmes in niche areas of electronics and ICT for the development of required knowledge base, skills and tools to equip the teaching community with better knowledge and understanding.

Objective and Scope

The proposed FDP on "*Advances in Robotics and Machine Learning*" brings an opportunity for academicians, research scholars and post graduate students across various engineering disciplines and mathematics to explore the field of robotics, control and machine learning approaches for robot control. This program will help participants not only to grasp the various Robotics and ML approaches concepts but also their applications. Robotics has become another parallel for engineering in different fundamental domains of engineering. Every field of engineering is getting a cutting edge because of the advancements in the robots used for that particular area of engineering. Hence, its understanding and knowledge becomes a basic necessity in the modern times. Many countries are launching their ultra modern robots capable of doing a range of complex tasks. It is indeed a need of the hour to generate more efforts and opportunities to explore the different directions of robotics and related areas. Machine learning has recently gathered good traction because of the way it is structured. The approach is about learning from the environment and then using that knowledge to perform the task assigned. Robots can utilize this in a great way. In this program we are going to discuss some of the examples where the machine learning approaches have been put to use by different researchers in India. We are bringing some of the potential and great minds at work in the domain of Robotics, Control and Machine Learning in this program on one platform. They are going to discuss different aspects of automation in robotics by using different control techniques and ML techniques.

Objectives of the Program

- To impart knowledge of principles and practices in robotics, and machine learning techniques for academicians, researchers, and students.

- To promote the use of knowledge and learnings in robotics, control and machine learning based concepts for problem solving in other engineering domains.
- To introduce some cutting-edge research trends in the field of machine learning and robotics engineering.

Topics to be covered

The following topics will be covered with possible simulation/experimental exposure: Wearable Assistive Robotics, Reinforcement learning based control design, Intent Estimation and Control in Human Robot Interaction, Human Robot Collaboration: Mastering Interactions, Adaptive Control of Robots with Artificial Time Delay, Adaptive Control of Robots: Toward Underactuated and Switched Dynamics, Reinforcement Learning for Serpentine Robots, Robotic Hand Control mechanism Using Deep Learning, Computer Vision Based Gesture Recognition in Collaborative Robotics, Robotics using Python, more to be added.

Resource Persons

1. **Prof. Amitava Chatterjee, Jadavpur University**
2. **Prof. Mangal Kothari, IIT Kanpur**
3. **Prof. Kaushik Das Sharma, Calcutta University**
4. **Prof. Rajesh Kumar, Univ. of Johannesburg**
5. **Dr. Sumit Kumar Jha, MNNIT Allahabad**
6. **Dr. Madan Mohan Rayguru, Liouville University**
7. **Dr. Abhilash Patel, IIT Kanpur**
8. **Dr. Spandan Roy, IIIT Hyderabad**
9. **Dr. Joyjit Mukherjee, BITS Hyderabad**
10. **Dr. Sayan Basu Roy, IIIT Delhi**
11. **Dr. Chandra Prakash, SVNIT Surat**
12. **Dr. Nalin Kumar Sharma, IIT Jammu**
13. **Dr. Bhabani Shankar Dey, IISc Bangalore**
14. **Dr. Golak Bihari Mahanta, NIT Patna**
15. **Dr. Sanjeev Kumar, BIT Mesra**
16. **Dr. Jyotindra Narayan, IIT Patna**
17. **Industry Experts from ELMAX Systems and Solutions, and Sevenky Tech**

One-week FDP includes

Five days Training will be taken by a group of experts from India and Abroad with the experience ranging from several years to several decades in delivering sessions in India and abroad. The training hour is 5-6 hours/ each day. Mode of training is Instructor-led live online.

- 40 Hours Instructor-led live online Hands-on based learning & Interactive Query Session.
- Soft copy of study material, Training PPTs & Projects code
- Participants will get recorded sessions after completion of training
- E-Certificates will be given to participants who have attended more than 70% sessions in the workshop.

Who Can Participate

Faculty members, Research scholars of recognized Universities from both India and Abroad, Research scholars, Students and Industry personals. However, priority will be given to the faculty members.

Registration Fee

For Indian Nationals: Rs. 500/- (Faculty/ Research Scholar/Student), Rs. 500/- (Industry)

For Foreigners: 60 US Dollars (Faculty/Research scholar/student), 60 US Dollars (Industry)

Registration Process

1. Registration fee should be paid through online mode, the account details for this purpose is

Account Name: E AND ICT Academy

Account No.: 50380476798

IFSC Code: IDIB000B810

Bank Name: Indian Bank, NIT Patna, Bihar

2. Registration form link:

<https://forms.gle/nxjaWSGZrRZAGLkZA>



Scan the above QR code for payment using UPI apps.

3. The brochure of the program may be downloaded from the Institute website www.nitp.ac.in.
4. Registration deadline: 5 Feb 2025 11:59 PM (IST)
5. A PDF file of the online filled registration form with proof of registration fee paid should be sent by email to Mr. Satish Kumar (email: satishk.ph24.ee@nitp.ac.in).

Total 200 seats and the selection will be done on first-cum-first-serve basis.

<https://nitp-ict.ct.ws/>