



Indian Institute Of
Technology, Guwahati

Centre For Career Development

Centre for
Intelligent Cyber
Physical Systems

Department Brochure



About the Institute

Since **1994**, when it was founded as the sixth Indian Institute of Technology, IIT Guwahati has become one of the world's most dynamic universities in technology, innovation, and research. The campus lies on a 285-hectare parcel of land on the northern bank of Brahmaputra 20km from the city centre. The curriculum and courses at IIT Guwahati are constantly changing to meet global needs and allow students to explore their interests.

The Institute offers **B.Tech, B.Des, MA, M.Des, M.Tech, MS(R), MBA, M.Sc, and Ph.D** programmes in 11 Departments, 9 Centres, and 5 Schools in all major engineering, science, and humanities areas. Our students can broaden their studies with a 'Minor' degree, open and interdepartmental electives, audit courses, and inter-disciplinary research.

The institute's state-of-the-art laboratories and **National Centres of Research** have made it a hub for research and technical education.

Apart from world-class research, the faculty prepares students for professional problems by teaching them their fields conceptually. It also helps students participate in worldwide projects, which helps them become pioneers and leaders.

IIT Guwahati has **MoUs (Memoranda of Understanding)** with top international institutes for semester-based student-exchange programmes and summer internships, boosting global integration and broadening our students' perspectives.

In their holidays, students intern in industrial, managerial, and research fields at top international corporations and research labs, contributing greatly. The institute provides excellent extracurricular opportunities to help students develop holistically.

About the Centre

The Centre for Intelligent Cyber Physical Systems (CICPS) at IIT Guwahati stands as a premier institution dedicated to pioneering advancements at the convergence of cyber-physical systems and artificial intelligence. Our mission is to drive technological innovation through comprehensive activities that include Technology Development, Human Resource Development, and Technology Business Incubation. CICPS is equipped with nine specialized laboratories—such as the Virtual & Augmented Reality Laboratory, the E-Mobility Laboratory, and the Internet of Things Laboratory—that support a wide range of research and development endeavours. These cutting-edge facilities play a crucial role in fostering innovation, aiding students from IIT Guwahati and other academic institutions across the northeast in their quest for technological breakthroughs.

Our MTech program in Robotics and Artificial Intelligence is designed for top-tier students who excel in the GATE examination, ensuring that we attract the brightest minds. The program offers an advanced curriculum that seamlessly integrates AI and robotics, covering areas like machine learning, computer vision, and intelligent automation. Students gain hands-on experience through direct engagement with our state-of-the-art laboratories, allowing them to design, develop, and test sophisticated systems and solutions. The program also emphasizes research opportunities, enabling students to contribute to groundbreaking projects and collaborate with industry leaders. Through this comprehensive approach, CICPS prepares students to be leaders in the technological landscape, equipped to tackle future challenges and drive forward-thinking innovations in AI and robotics.

From the desk of HOC

CICPS at IITG is established with a vision to empower a secure, sustainable and connected future through innovative intelligent cyber physical systems. It is an interdisciplinary centre where 35 faculty members from different departments namely ME, EEE, CSE, Civil and DoD are associated. The centre promotes the activities focused on technology development and human resource development through MTech and PhD program. The centre aims to advance intelligent cyber-physical systems that seamlessly integrate the digital and the physical realms. It is committed to pioneering cutting-edge technology, fostering innovations, and driving sustainable solutions to enhance efficiency, safety and connectivity across diverse industries.

By bridging the gap between the physical and the digital world, CICPS aims to harness the power of robotics, artificial intelligence and machine learning to have automation, data driven decision making and human machine interface. Based on our course structure and research activities, our students are trained to address the real time complex problems. Through continuous research, development and collaboration with industries, our students are the forefront of innovation and setting a new target for their achievement. Apart from robotics, controls and AI and ML, different advanced courses are being offered as electives to enrich the knowledge of our students to meet the current challenges and requirements of industries.

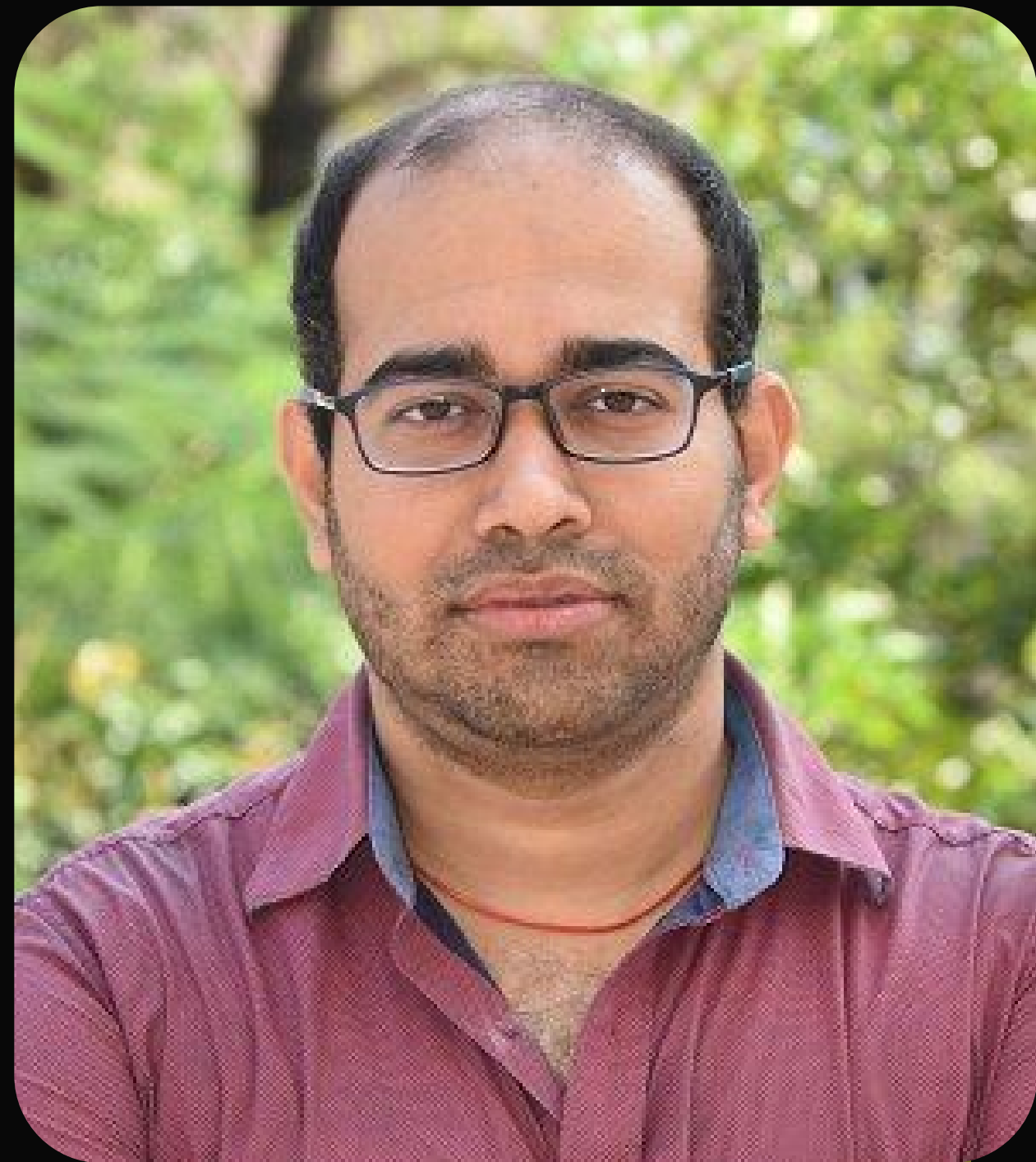
I, on behalf of CICPS, wish our students success in their future endeavours.



Prof. S. Kanagaraj

**Professor and Head,
Centre for Intelligent
Cyber-Physical Systems**

Message from Faculty Advisor



Dr. Biranchi Panda

Faculty Advisor,
Centre for Intelligent
Cyber-Physical Systems

The Center for Intelligent Cyber Physical Systems at IIT Guwahati aims at fostering interdisciplinary research collaborations that integrate physical and computational systems. The academic curriculum of this center is designed to enable students to solve radical problems using Computer vision, Robotics, Machine learning, Sensors, and Control through via fundamental and applied research . Many of our students are doing extremely well in global companies and overall, our students possess the necessary knowledge, multi-disciplinary skills and problem-solving abilities that enable them to take on engineering as well as strategic visionary roles in the industry. On behalf of the Center, I welcome prospective recruiters to visit us and participate in the on-campus placement process at IIT Guwahati.

Programmes Offered

M.Tech

Robotics and Artificial Intelligence is a Two-year M Tech programme that is a first-of-its-kind multi-departmental initiative offered by CICPS where 20 students are supported by MoE and another 20 students are sponsored by different industries and companies including IITG-TIDF.

With a specialized focus on nurturing expertise in cutting-edge fields, our MTech program in Robotics and Artificial Intelligence (AI) within the Centre for Intelligent Cyber-Physical Systems (CICPS) encompasses a holistic exploration of advanced technologies. Through a meticulously designed curriculum, students gain in-depth insights into [AI, machine learning, robotics, control, human-machine interaction, and cyber-physical systems](#). Our program not only imparts theoretical foundations but also provides hands-on experience, enabling students to develop practical skills that are highly relevant in today's rapidly evolving technological landscape. With access to state-of-the-art labs and guidance from distinguished faculty, students are empowered to push the boundaries of innovation and contribute meaningfully to the above mentioned field.

Ph.D

The doctoral programme consists mainly of open-ended research work that is expected to contribute many innovative research areas including the technologies for underwater exploration. The primary goal of the centre is to provide students with a wide variety of educational experiences: developing their problem-solving skills, challenging them with open-ended problems and design projects, providing opportunities for teamwork, developing their written and verbal communication skills, and making research or independent study experiences available to those students with the desire and capability.

27

Total number of
students in graduating
batch

19

Students

Course Curriculum

Compulsory Courses

Artificial Intelligence

Fundamentals of Robotics

Machine Learning

Robot Sensing and Vision

Technical Writing

Compulsory Labs

Programming Laboratory

Robot Design Laboratory

Artificial Intelligence Lab

Elective Courses Undertaken

Speech Technology

Video Analytics

Control Engineering for Robotics

Optimization Methods in Engineering

Image Processing with ML

NLP with LLMs

Mathematics for Computer Science

Neural Networks for NLP

Deep Learning

Virtual and Augmented Reality Systems

C Based VLSI Design

Mobile Robotics

Key Research Areas

Research Domains

Artificial Intelligence

Robotics: Control and Sensing

Internet of Things

Underwater Systems

Smart Manufacturing

Biomechanics and Biomedical
Devices

Artificial Intelligence

Machine Learning

Deep Learning

Computer Vision

Natural Language Processing

Speech and Audio Signal
Processing

Data Science and Analytics

Robotics Control and Sensing

Modelling, Analysis and Design
of Robotic Systems

Intelligent Sensing and Control
for Autonomous Vehicles

Control of Swarm Systems

Sensor and Actuator Design

Key Research Areas

Underwater Systems

Underwater Systems:
Design and Development

Underwater Exploration

Underwater Structural Analysis

Sonar and Underwater
Acoustics

Power Electronics for
Underwater Systems

Underwater Concrete Printing

Smart and Intelligent Manufacturing

Robotics Manufacturing

AI and ML in Manufacturing
Processes

Digital Twin of Manufacturing
Systems and processes

Internet of Things and other domains

Sensors

Embedded Systems

Image Enhancement

Augmented Reality

Human-computer Interaction

Research Laboratories



Product Development Lab



Internet of Things Lab



E-Mobility Lab



Underwater Natural Resources
Lab

Research Laboratories



Virtual & Augmented Reality Lab



Reverse Engineering Lab



Product Testing Lab



Actuator Fabrication Laboratory

Projects and Awards

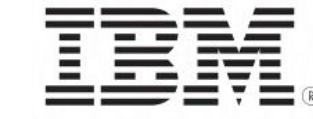
Project Title	Principle investigator	Funded agency
Design and Development of a Robotic Vision System for Underwater Trash Detection using Subsea Inpainting and Textual Artifact Analysis	Dr. Anirban Dasgupta	CICPS
Computer Vision for Under Water Exploration under Technology Innovation Hub on Under Water Exploration	Dr. Arijit Sur	CICPS
Design and Development of a Motion Planning and Control Scheme for an AUV swarm with Application to Underwater Surveillance	Dr. Parijat Bhowmick	CICPS
Multi-Axis Multi-Material Wire Arc Additive Manufacturing	Dr. Sajan Kapil	DSTA, GOI
Award	Recipients	
Microsoft Outstanding Young Faculty Award	Dr. Arijit Sur Dr. Amit Awekar Dr. Sonali Chouhan	
Best Exhibitor at NERC	Dr. Biranchi Panda	
InSc Young Researcher Award 2022	Dr. Parijat Bhowmick	

Past Recruiters



Past Recruiters

SAMSUNG



DevRev

Flipkart 



Razorpay



BCG

Deloitte.

Meta



amazon

Capgemini

Infosys

BARCLAYS



BOSCH



pwc

Contact Details



Head of Centre
Prof. S. Kanagaraj

Contact- +91 3612582676



Priyanshu Kumar
+91-70612-66042



Avinav Yadav
+91-70784 79185

Overall
Placement
Coordinators



Subhojit Jash
+91 94342 49726



Reetu Raj Chauhan
+919830640348



Faculty Incharge
Dr. Biranchi Panda

Contact- +91 9633037489

Department
Placement
Representative

Mail us at : placement@iitg.ac.in
Website - www.iitg.ac.in/ccd