

Robot Modeling and Control, and Applications to Aerial Robots

Overview

With increase in applications of robots, the field of robotics has taken greater strides in the past two decades. One specific area, which has gained attention in the research community, is control of aerial robots. Aerial robots find widespread applications in industries like agriculture, defence, transportation, etc. This course introduces fundamentals of robotics and advanced topics in aerial robots.

The course is organized in three modules that can be taken separately. The first module introduces fundamentals of robotics. This module is specifically designed for the beginners who are working in the field of robotics but do not have sufficient mathematical background. The second module presents techniques of dynamic modeling and vision-based control, and assumes that the learners have knowledge of the first module. The third module builds on the first two modules and is intended for the advanced learners. It focuses on quadrotor modeling, motion planning, control, localization and some research issues.

Emphasis in the course would also be given on learning through practicing the concepts taught. This would be realized through carefully designed laboratory/tutorial sessions.

Modules	A: Kinematics, Control and Differential Flatness : Dec 22 – Dec 23, 2015 B: Dynamics and Vision-based Control : Dec 24 – Dec 25, 2015 C: Quadrotor Modeling and Control : Dec 26 – Dec 28, 2015													
You Should Attend If...	<ul style="list-style-type: none"> ▪ you are a practicing engineer or research scientist interested in understanding principles of robot modeling and control, and learning advanced topics on aerial robots. ▪ you are a faculty or student from academic institution interested in teaching/learning modeling, motion planning and control of robotic systems and how to research on aerial robots. ▪ you are working on aerial robots and interested in knowing state of art activities and keen to carry out research in the area. 													
Fees	<p>The participation fees for taking the course is as follows: Participants from abroad : US \$500 Participants from India:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;"></th> <th style="width: 30%;">One module</th> <th style="width: 30%;">All modules</th> </tr> </thead> <tbody> <tr> <td>Industry</td> <td>Rs. 5,000/-</td> <td>Rs. 10,000/-</td> </tr> <tr> <td>Research Organizations/ Academic Institutions</td> <td>Rs. 3,000/-</td> <td>Rs. 6,000/-</td> </tr> <tr> <td>Students*</td> <td>-----</td> <td>Rs. 1,000/-</td> </tr> </tbody> </table> <p style="text-align: center;">* The course fee will be made half for SC/ST students.</p> <p>The above fee includes all instructional materials. Limited number of paid accommodations will be served on first come first serve basis.</p> <p>Number of participants for the course will be limited to Sixty. Short listed candidates would be notified via email through GIAN portal.</p>			One module	All modules	Industry	Rs. 5,000/-	Rs. 10,000/-	Research Organizations/ Academic Institutions	Rs. 3,000/-	Rs. 6,000/-	Students*	-----	Rs. 1,000/-
	One module	All modules												
Industry	Rs. 5,000/-	Rs. 10,000/-												
Research Organizations/ Academic Institutions	Rs. 3,000/-	Rs. 6,000/-												
Students*	-----	Rs. 1,000/-												

The Faculty



[Prof. Vijay Kumar](#) is the Nemirovsky Family Dean of Penn Engineering with appointments in the Departments of Mechanical Engineering and Applied Mechanics, Computer and Information Science, and Electrical and Systems Engineering at the University of Pennsylvania. His research interests are in robotics, specifically multi-robot systems, and micro aerial vehicles.



[Prof. Suddipto Mukherjee](#) is the Volvo Chair Professor of Design and Manufacturing in the Department of Mechanical Engineering at the Indian Institute of Technology Delhi. His areas of interest include Robotics, Mechanical System Design, Computer Controlled Mechanisms, Dynamics and Biomechanics.



[Dr. Suril Shah](#) is an Assistant Professor in the Department of Mechanical Engineering at the Indian Institute of Technology (IIT) Jodhpur. His fields of interest include robotics and multibody dynamics.

Course Co-ordinator

Dr. Suril Shah
Phone: +91-291-2449009
E-mail: surilshah@iitj.ac.in

.....
..
Course registration Link:
<http://www.gian.iitkgp.ac.in/GREGN>