

Autonomous Systems

Overview

With the recent focus being on developing autonomous vehicles for carrying out sophisticated tasks, there is a lot of emphasis on system identification, state estimation, control techniques, and sensor integration. The workshop will aim at introducing the participants to control techniques, state estimation, and sensor integration for unmanned vehicles. The course will enable students and practicing professionals gain proficiency in theory and application of the technologies, algorithms, and tools relevant to autonomous systems. The course will blend theory and practical exercises to expose the participants to autonomous systems and provide them with a working knowledge/experience. By the end of the course the participants will, (i) Develop an understanding and will use standard tool chains for modeling, simulation and control of autonomous systems, such as MATLAB/Simulink, and ROS; (ii) Utilize various types of sensors and implement suitable sensor fusion methods, and state estimation techniques; (iii) Implement linear, nonlinear, and robust navigation, guidance, control algorithms; (iv) Use machine vision and learning methodologies to support path planning and obstacle avoidance. There is no prescribed text and the instructors will provide notes.

Logistics	<ul style="list-style-type: none">○ 18 – 22 December, 2017: Autonomous Systems○ IIT Kanpur○ Number of participants is limited to 25
Intended Audience	<ul style="list-style-type: none">○ Students at all levels (BTech/MSc/MTech/PhD) and faculty members from academic and technical institutions across the world○ Engineering working in service and government organizations including R & D Laboratories and Industry.
Fees	Academic institution: 10,000/- Industry and R&D organizations: 20,000/- The above fee includes all instructional materials, tutorials and assignments, hands on equipment. The participants will be provided with accommodation on payment basis.

The Faculty

Kamesh Subbarao is Associate Professor and director of the Aerospace Systems Laboratory (ASL) in the Mechanical and Aerospace Engineering Department at The University of Texas at Arlington (UTA). He received his PhD from the department of Aerospace Engineering at Texas A & M University, College Station in 2001. After his PhD he worked as an Applications Developer at The MathWorks Inc. (2001-2003) in the Controls and Systems Identification and Estimation Toolboxes group. His research interests span flight mechanics, simulation and control, astrodynamics, nonlinear and adaptive control, linear and nonlinear filtering/estimation approaches, cooperation and coordination for multiple unmanned vehicles subject to measurement uncertainties and distributed time delays. Dr. Subbarao's research has been funded by DARPA, NSF, AFRL, NASA, Lockheed Martin, Whirlpool Inc., Nextgen Aeronautics and Hypercomp Inc.



Mangal Kothari is Assistant Professor in the Department of Aerospace Engineering at the Indian Institute of Technology, Kanpur. His research interests are in the areas of Optimal control, Nonlinear and Adaptive control, Flight Vehicle Guidance and Control, Motion Planning, Coordinated control of UAVs, and Nonlinear Observer and Estimation.



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