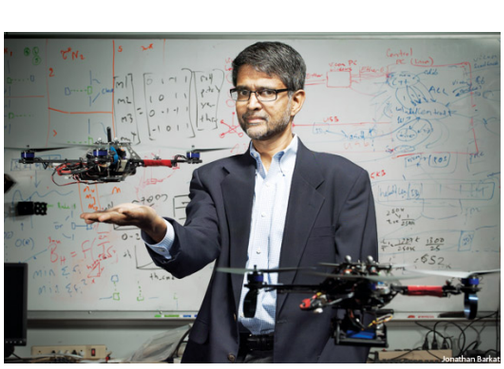
Institute Lecture



From UAVs to Flying Robots

Prof. Vijay Kumar
UPS Foundation Professor
Departments of Mechanical Engineering and
Applied Mechanics and Computer and Information Science,
Deputy Dean (Education), School of Engineering and Applied Science, University of Pennsylvania
Former Assistant Director, Robotics and Cyber Physical Systems, Office of Science and Technology Policy, Executive Office of President, Washington

Monday, November 3, 2014, Time: 4.30 PM, Venue: Outreach Auditorium

Abstract

The last decade has seen a growing interest in drones and a proliferation of UAVs. This talk will address the challenges and opportunities for developing smart aerial robots with applications in search and rescue, first response and precision forming. I will describe our work in designing small, agile robots, how to control and plan autonomous motions, our approach to localization in environments without GPS, and finally our framework for cooperative control.

About the speaker

Prof. Vijay Kumar obtained B. Tech. degree in Mechanical Engineering from Indian Institute of Technology Kanpur in 1983. He obtained M.Sc. in 1985 and PhD in 1987 both from the Ohio State University, Columbus in Mechanical Engineering. His PhD dissertation was Motion Planning for Legged Locomotion Systems on Uneven Terrain. Prof. Vijay Kumar is one of the top roboticists of the world. His fundamental contributions, which straddle both theory and practice, address the control and planning of multiple cooperating robot systems and autonomous robots capable of cooperating to explore, map and manipulate in 3-D environments. His recent ground-breaking research in micro unmanned vehicles has led to flying robots with extraordinary agility and unprecedented autonomy. This work, which is exemplary in the synthesis of rigorous mathematics and careful experimentation, has been featured in remarkable demonstrations (over 10M views on Youtube), numerous public lectures (over 2M views of TED talk) and featured by numerous media outlets. His work in the last five years has transformed the field of micro autonomous systems, specifically, aerial robots. Prof. Kumar was the recipient of the 1991 National Science Foundation Presidential Young Investigator award, the Lindback Award, University of Pennsylvania in 1996 and Freudenstein Award in 1997. He received ASME Mechanisms and Robotics Award, IEEE Robotics and Automation Society Distinguished Service Award and a World Technology Network Award in 2012. He is a recipient of The Ohio State University Distinguished Alumnus Award in 2012. He obtained the George H Heilmeier Faculty Award for Excellence in Research for "pioneering contributions to the science and technology of cooperative robotics". He was elected to the National Academy of Engineering, and he also won Popular Mechanics Breakthrough Award in 2013. The Joseph Engelberger Award was awarded to Prof. Kumar by the Robotic Industries Association in 2014.

Prof. Vijay Kumar has been honoured with Distinguished Alumnus Award by IIT Kanpur for his outstanding contributions to the area of control and coordination of multi-robot formations.

Tea at 4.15 PM

All interested are welcome.

Amalendu Chandra
Dean of Research and Development, IIT Kanpur