

PRISM Lecture Series on Robotics, Computer Vision and Human Computer Interaction

Date: March 9, 2016 (Wed.) Time: 11:30am~12:30pm

Venue: Steinman Hall, **Exhibit Room**

Fish 'n' Robots: not a take-out food

Prof. Maurizio Porfiri

Department of Mechanical and Aerospace Engineering

New York University Tandon School of Engineering

ABSTRACT

Engineering design of robots is often inspired by nature; recently developed bioinspired robots accurately imitate various aspects of their live counterparts. Yet, the relationship between engineering and nature has often been one-directional: engineers borrow ideas from nature to build more efficient, more appealing, and better performing robotic systems for use in traditional human-centered applications. In some cases, these systems are used as proxies for studying the natural system, but whether these devices can be integrated within the ‘ecological niche’ inspiring their design seldom is experimentally tested. An even more elemental research question pertains to the feasibility of modulating spontaneous behavior of animal systems through bioinspired robotics. In this talk, we discuss recent research findings at the Dynamical Systems Laboratory of New York University on the feasibility of integrating robotic fish in experimental paradigms to investigate the behavior of social fish. In this context, autonomous robots can be used to offer consistent, customizable, and controllable stimuli for decomposing the complex nature of information sharing and decision making in fish. This talk will address fundamental scientific questions such as: is fish behavioral response influenced by a robotic fish and, if so, what is the consistency of such response? What are the determinants of attraction or repulsion of a robotic fish, and can they be modulated through the administration of psychoactive compounds? How can we objectively quantify the interactions between fish and robots? What is the role of hydrodynamic effects and visual cues? Does the behavior and motion of a robotic fish influence fish social response? How does fish perceive schools of robotic fish? Do fish interact differently with a robotic fish depending on their ‘personality’?

Bio: Maurizio Porfiri is a Professor in the Department of Mechanical and Aerospace Engineering at New York University Tandon School of Engineering. He received M.Sc. and Ph.D. degrees in Engineering Mechanics from Virginia Tech, in 2000 and 2006; a “Laurea” in Electrical Engineering (with honours) and a Ph.D. in Theoretical and Applied Mechanics from the University of Rome “La Sapienza” and the University of Toulon (dual degree program), in 2001 and 2005, respectively. He is engaged in conducting and supervising research on dynamical systems theory, multiphysics modeling, and underwater robotics. Maurizio Porfiri is the author of more than 200 journal publications and the recipient of the National Science Foundation CAREER award. He has been included in the “Brilliant 10” list of Popular Science in 2010 and his research featured in all the major media outlets, including CNN, NPR, Scientific American, and Discovery Channel. Other significant recognitions include invitations to the Frontiers of Engineering Symposium and the Japan-America Frontiers of Engineering Symposium organized by National Academy of Engineering; the Outstanding Young Alumnus award by the college of Engineering of Virginia Tech; the ASME Gary Anderson Early Achievement Award; the ASME DSCD Young Investigator Award; and the ASME C.D. Mote, Jr. Early Career Award.