

seminar

Soft Robotic Systems for Wearable Applications

Panagiotis (Panos) Polygerinos, PhD
The Polytechnic School
Ira A. Fulton Schools of Engineering

abstract

“Soft Robotic Systems for Wearable Applications”
Abstract: The inherent compliance in soft material robotic systems can enable capabilities and task versatility not found in traditional rigid-bodied robotic systems. The robots of the future will use soft design approaches to provide a more conformal, unobtrusive and compliant means to interface and interact, externally and internally, with the human body, and will be able to monitor, assist, or augment capabilities of individuals. For example, elastomeric and textile actuators powered by pressurized fluid (i.e. pneumatics or hydraulics) can offer several desirable features including robust, lightweight structures, inexpensive development, proven fabrication methods, and simple as well as complex motion paths with simple inputs. Furthermore, these actuators can provide compliance, fast actuation speeds, and most importantly safe human interaction, making them ideal for wearable and medical applications. This talk will focus on soft components (actuators and sensors) as well as integrated systems that are tested in realistic clinical settings. The first part will cover the principle of operation of soft composite elastomeric actuators, as well as their design and fabrication. The second part of the talk will present different projects that demonstrate the design, fabrication and sensing principles required to realize soft wearable robotic systems.

biosketch

Panagiotis (Panos) Polygerinos is an Assistant Professor of Engineering with the Ira A. Fulton Schools of Engineering at Arizona State University. His research interests focus on the realization of tasks that are essential to the design, implementation and integration of novel robotic systems and mechatronic devices that have significant potential to improve patient care and human activity.

Prof. Polygerinos received a Bachelor's degree in Mechanical Engineering from the Technological Educational Institute of Crete, Greece in 2006 (top of his class), a M.S. degree in Mechatronics (with distinction), and Ph.D. in Mechanical Engineering from King's College London, London, U.K., in 2007 and 2011, respectively. As a Ph.D. candidate and under the supervision of Prof. K. Althoefer in the Centre for Robotics Research at King's College London, Panagiotis designed, developed and evaluated novel miniature MRI compatible sensors for cardiac catheters. In 2012, he joined as a postdoctoral fellow with the Harvard Biodesign Lab (Prof. C. J. Walsh) and the Wyss Institute for Biologically Inspired Engineering at Harvard University, where he worked on soft robotic systems and wearable devices for people with upper extremity disabilities. He continued his research as a Wyss Postdoctoral Fellow of Technology Development at the Wyss Institute and collaborated with researchers, engineers, industrial and functional apparel designers, clinicians, and business professionals to develop new wearable assistive and medical technologies. Contact: polygerinos@wyss.harvard.edu

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