



ME Department Seminar

Toward Autonomy, a Design and Fabrication Strategy for Completely Soft Robots

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Thursday, November 3, 2016

1018 HH Dow

4:00 PM

Abstract:

In recent years, the nascent field of soft robotics has emerged as an exciting area of research and development. Soft robots possess many attributes that are difficult, if not impossible, to achieve with conventional robots composed of rigid materials. Yet, despite recent advances, soft robots still require traditional control and power systems, thus they remain either tethered to remote hardware, or they are soft-rigid hybrid systems. Recent work has explored possible soft analogs for these standard rigid components. While new challenges arise from the incorporation of these new components, new possibilities arise as well. Elimination of rigid components allows the shrinking of length scales and development of new form factors impossible with traditional motors, batteries, and electronic controllers. We look at the use of novel soft controllers, alternate fuel source, and soft actuators and explore possible form factors and applications. These components are brought together via a design and rapid fabrication approach, which lays the foundation for a new class of completely soft, autonomous robots.

Bio:

Doctor Wehner earned his Ph.D. from the University of California at Berkeley, where he studied engineering and developed an exoskeleton-based system to reduce back forces during industrial lifting.

Michael Wehner is a research fellow at the Harvard Microrobotics lab. His current research focuses on design, fabrication, and control of soft robots including alternative energy sources, microfluidic control systems, and actuation strategies. Doctor Wehner is particularly interested in morphological computation, human-machine interface, and robots in populated environments.