Control Seminar

Feedback

Honoring Elmer Gilbert (1930-2019) and his contributions to Control Systems

Let's Walk and Talk: Co-Design of Mobility and Communications (and Sensing) for Ubiquitous Robots

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Friday, January 31, 2020
3:30 – 4:30 pm   1500 EECS Bldg.

ABSTRACT: The goal of my lab's research is to move us towards a world where everyone, everywhere can have and use robots. Towards that end, we study accessible custom creation of electromechanical solutions; this paradigm begets individual devices with significant resource constraints and lower individual capabilities. We need to then also come up with new control strategies that can achive high level behaviors despite this resulting low fidelity hardware. In particular, we co-design across subsystem boundaries–particularly sensing, communications, and mobility–to optimize overall task performance.

We can explore this paradigm particularly as it relates to multi-robot systems. With the careful use of networking capabilities, resources and results can be effectively shared among agents to achieve greater system-wide performance. For example, most systems of mobile robots need to compute some shared state estimate (such as swarm localization); we investigate new algorithms for joint sensing and communication planning. When considering other sensing or coverage tasks, we develop motion planning algoriths around communications constraints. We explore new representations of state to address more fundamental questions in multi-robot analysis.

Our work on these topics will come together with our other research on design and fabrication to allow accessible and low-cost functional robots for everyone.

BIO: Prof. Ankur Mehta is an assistant professor of Electrical and Computer Engineering at UCLA, and directs the Laboratory for Embedded Machines and Ubiquitous Robots (LEMUR). Pushing towards his visions of a future filled with robots, his research interests involve printable robotics, rapid design and fabrication, control systems, and multi-agent networks.

Prof. Mehta was a postdoc at MIT's Computer Science and Artificial Intelligence Laboratories investigating design automation for printable robots; prior to that, he conducted research as a UC Berkeley graduate student in wireless sensor networks and systems, small autonomous aerial robots and rockets, control systems, and micro-electro-mechanical systems (MEMS).

Prof. Mehta received the NSF CAREER award in 2018, and was named a Samueli Fellow in 2015. He has received best paper awards in the 2015 *IEEE Robotics & Automation Magazine* and *2014 International Conference on Intelligent Robots and Systems (IROS).*

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