Tokyo Tech – UC Santa Barbara Joint Symposium
**Field Meeting, Mechanical Engineering**

# Opportunities and Challenges in Control Systems arising from Ubiquitous Computation and Communication

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**9:30-10:30, I3-306**


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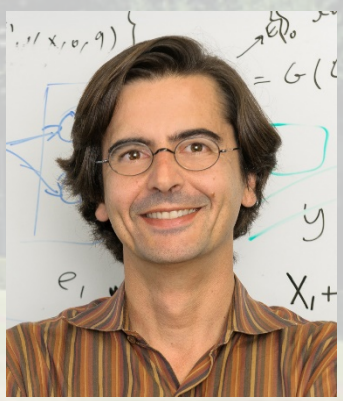


Advances in VLSI (Very Large Scale Integration) design and fabrication have resulted in the availability of low-cost, low-power, small-sized devices that have significant computational power and are able to communicate wirelessly. In addition, advances in MEMS (Micro Electric Mechanical Systems) technology have resulted in wide availability of solid-state sensors and actuators. The net result is ubiquitous sensing, communication, and computation that can be incorporated into small low-power devices.

In this talk, I will discuss how the above-mentioned technological advances present important opportunities and interesting challenges for control system designers. To this effect, I will discuss how the introduction of digital communication in control loops gives rise to a need for new tools for the design and analysis of feedback control systems. I will also describe recent work demonstrating that feedback control based on on-line optimization is a viable approach to solve a wide range of control problem.