

THE DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING PRESENTS

FACULTY CANDIDATE:

KONSTANTINOS GATSI



CONTROL FOR THE INTERNET-OF-THINGS

ABSTRACT

Emerging autonomous applications in the Internet-of-Things are enabled by sensing, processing, learning, and actuation capabilities joined by wireless communication. These connected communities of data-driven agents are in close interaction with the physical world as they collect data signals from sensors, learn and adapt to disturbances, coordinate, and actuate in an autonomous closed-loop fashion. Application domains include future transportation systems, industrial automation, robotics, and smart infrastructures. These applications give rise to new fundamental engineering challenges. In this talk I will discuss the challenge of rethinking control at the edge of the Internet of Things, to address limited transmit power resources at the sensors as well as limited spectrum availability. I will emphasize the joint allocation of resources and closed loop control performance and illustrate how this gives rise to novel interfaces, showing the importance of adaptation to both control performance needs and wireless communication opportunities. I will also illustrate the benefits of using this framework for spectrum management across multiple control systems in the next generation Wi-Fi protocol. Additionally, to cope with uncertainty and lack of models I will discuss how learning techniques can be leveraged at the operation of the connectivity layer in the Internet-of-Things. I will conclude with ongoing and future research drives for safe, secure, autonomous applications in the Internet-of-Things.

BIOGRAPHY

Konstantinos Gatsis is a Postdoctoral Researcher at the Department of Electrical and Systems Engineering at the University of Pennsylvania. He received the Ph.D. degree in electrical and systems engineering from the University of Pennsylvania, Philadelphia in 2016, and the Diploma degree in electrical and computer engineering from the University of Patras, Patras, Greece in 2010. His research interests include cyber-physical systems and the Internet-of-Things as well as control, learning, security, and optimization algorithms. Dr. Gatsis received the Joseph, D'16, and Rosaline Wolf Award for Best Doctoral Dissertation from the department of Electrical and Systems Engineering at the University of Pennsylvania. He also received the 2014 O. Hugo Schuck Best Paper Award, the Student Best Paper Award at the 2013 American Control Conference, and was a Best Paper Award Finalist at the 2014 ACM/IEEE International Conference on Cyber-Physical Systems.

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SEMINAR: 11:10 A.M. - 12:00 P.M.
*** VISION TALK: 12:00 P.M. - 12:30 P.M.**

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