



## Information for Control and Estimation in Autonomous Systems

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**Abstract:** It is evident that the improvement of smart devices with advanced sensing, computing and control capabilities makes it possible for our cities, transportation systems, factories and living environments to become more intelligent, energy-efficient, and secure. Typically, the overall system is spatially distributed and communication between smart devices (being sensors, actuators or controllers) is mainly supported by a shared, wireless communication network. These systems are known as Wireless Networked Control Systems (WNCSs). The control performance of the dynamical systems (herein called subsystems) is traded off against the communication requirements by controlling the amount of data being transmitted. The unprecedented tight coupling between control and communication, due to the use of a shared wireless network and distributed decision making to orchestrate such systems, introduces new challenges. Current modular design approaches and incremental improvements can only provide limited performance gains and may result in inefficient solutions, which may lead to failures during practical deployments. Bridging the gap between the fields of control, estimation, and information/communication theories, we follow a bottom-up approach to develop a fundamental, yet realistic, framework to establish the foundations for real-time control, estimation, and localization in environments where autonomous systems and humans interact.

**Biography:** Themistoklis Charalambous received his BA and M.Eng in Electrical and Information Sciences from Trinity College, Cambridge University. He completed his PhD studies in the Control Laboratory of the Engineering Department, Cambridge University in 2009. Following his PhD, he joined the Human Robotics Group as a Research Associate at Imperial College London (2009-2010). He also worked as a Visiting Lecturer at the Department of Electrical and Computer Engineering, University of Cyprus (2010-2011), as a Postdoctoral Researcher at the Department of Automatic Control of the School of Electrical Engineering at the Royal Institute of Technology (KTH) (2012-2015), and as a Postdoctoral Researcher at the Department of Electrical Engineering at Chalmers University of Technology (2015-2016). In 2017, he joined the Department of Electrical Engineering and Automation, School of Electrical Engineering, Aalto University as a tenure-track Assistant Professor becoming a tenured Associate Professor in 2020. Since September 2021, he has been a tenure-track Assistant Professor at the Department of Electrical and Computer Engineering at the University of Cyprus.