Robust Cyber-Physical Systems: An utopia within reach

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Abstract
Robustness plays a major role in the analysis and design of engineering systems. Although robust control is a well established area within control theory and fault-tolerant computation is a well established area within computer science, it is surprising that robustness remains a distant mirage for Cyber-Physical Systems. The intricate crochet made of control, computation, and communication yarns is known to be brittle in the sense that “small” software errors or "small" sensing, communication, or actuation noise can lead to unexpected, and often unintended, consequences. In this talk I will build on classical notions of robustness from control theory and computer science to make progress towards the utopia of robust Cyber-Physical Systems.

Biography
Paulo Tabuada was born in Lisbon, Portugal, one year after the Carnation Revolution. He received his "Licenciatura" degree in Aerospace Engineering from Instituto Superior Tecnico, Lisbon, Portugal in 1998 and his Ph.D. degree in Electrical and Computer Engineering in 2002 from the Institute for Systems and Robotics, a private research institute associated with Instituto Superior Tecnico. Between January 2002 and July 2003 he was a postdoctoral researcher at the University of Pennsylvania. After spending three years at the University of Notre Dame, as an Assistant Professor, he joined the Electrical Engineering Department at the University of California, Los Angeles, where he established and directs the Cyber-Physical Systems Laboratory.

Paulo Tabuada's contributions to cyber-physical systems have been recognized by multiple awards including the NSF CAREER award in 2005, the Donald P. Eckman award in 2009 and the George S. Axelby award in 2011. In 2009 he co-chaired the International Conference Hybrid Systems: Computation and Control (HSCC'09) and in 2012 he was program co-chair for the 3rd IFAC Workshop on Distributed Estimation and Control in Networked Systems (NecSys'12). His latest book, on verification and control of hybrid systems, was published by Springer in 2009.

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