Sensor Andrew: Ubiquitous Wide Campus Sensing Exploitation

José M. F. Moura
Department of Electrical and Computer Engineering
Carnegie Mellon University
moura@ece.cmu.edu
http://www.ece.cmu.edu/~moura

Carnegie Mellon University has a long history of innovation in campus wide availability of networking infrastructures. In the early 80's, *Andrew* was inaugurated as a campus wide (wired) networking infrastructure that in a few years networked faculty, staff, and students (undergraduate and graduate) all across campus – offices, dormitories, room facilities. In 1995, Carnegie Mellon embarked on a similar effort with Wireless Andrew that from 6 access points in 1995 went to hundreds and then thousands of access points in a couple of years providing global campus wireless coverage (see *IEEE Personal Communications Magazine*, February 1996). Both infrastructures served as campus wide testbeds to experiment and develop emergent technologies at the time. In 2006, Carnegie Mellon, through CenSCIR, the newly formed *Center for Sensed Critical Infrastructure Research*, has launched *Sensor Andrew*, a campus wide living laboratory to deploy thousands of sensing platforms of various types, providing campus wide instrumentation coverage, and supporting the breadth of applications users feel the need to develop. This keynote will overview *Sensor Andrew*, and describe its hardware, software, and middleware infrastructure, as well as some of the applications that are being developed. We will also address the issues related to what to do with the large amounts of data collected by an application supported on Sensor Andrew, how to process these data in a distributed fashion, and how to infer from the localized sensor information global understanding and global behaviors.

Sensor Andrew is the joint effort of a large team, see http://www.ices.cmu.edu/censcir/

Short resume: José M. F. Moura is a Professor of ECE at CMU and founding co-director of CenSCIR, the Center for Sensed Critical Infrastructure Research. In 2006-07, he is on sabbatical at MIT as a Visiting Professor of EECS. He holds MSc, EE, and D.Sc. EECS degrees from MIT and an EE degree from Instituto Superior Técnico (Lisbon, Portugal). His interests are in communications, algebraic and statistical signal/ image processing. His current research includes distributed decision in sensor networks, time reversal imaging, SPIRAL, an intelligent compiler for signal processing transforms.

He serves as President for the IEEE Signal Processing Society (SPS) (2008-09), is on the Editorial Board of the IEEE Proceedings and was on the Board of several other Journals, including the ACM Sensors Journal, and on the steering committee of the ACM/IEEE International Symposium on Information Processing and Sensor Networks (IPSN). He was the Editor in Chief for the IEEE Transactions on Signal Processing. He is a Fellow of the IEEE, a Fellow of AAAS, and a corresponding member of the Academia das Ciências of Portugal. He received the IEEE 3rd Millennium Medal, an IBM Faculty Award, the CMU CIT Outstanding Research Award, and the IEEE SPS Meritorious Service Award.