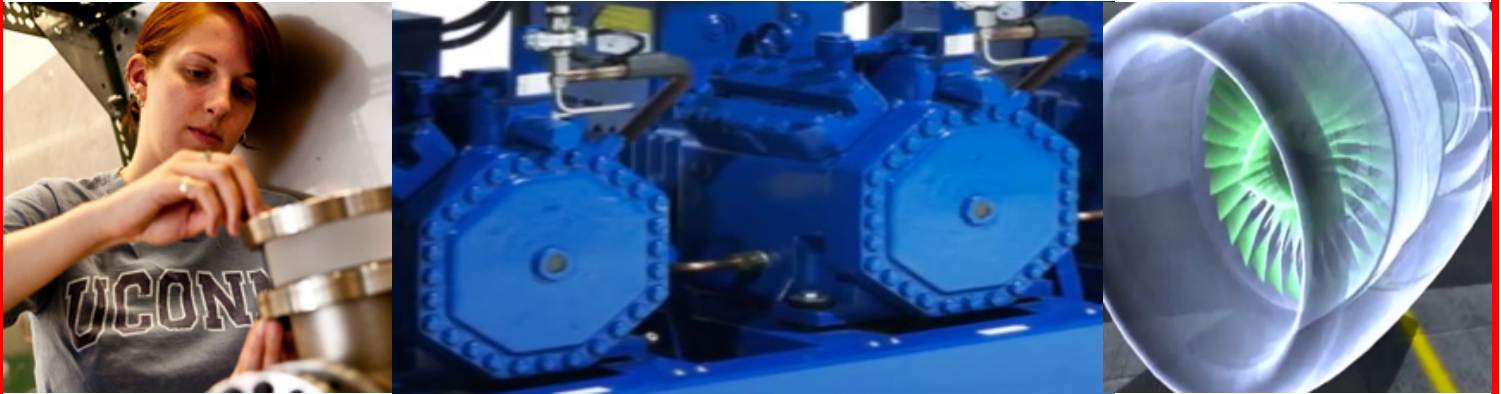


UTC Institute for Advanced Systems Engineering Distinguished Lecture Series



Dr. Alberto Sangiovanni-Vincentelli
University of California at Berkeley

Let's Get Physical: Adding Physical Dimensions to Cyber Systems

Friday April 10, 2015

10:00 a.m. – 12:00 p.m.

Storrs Campus, Dodd Center, Konover Auditorium

Abstract: In cyber-physical systems (CPS) computing, networking and control (typically regarded as the “cyber” part of the system) are tightly intertwined with mechanical, electrical, thermal, chemical or biological processes (the “physical” part). The increasing sophistication and heterogeneity of these systems requires radical changes in the way sense-and-control platforms are designed to regulate them. In this presentation, I highlight some of the design challenges due to the complexity and heterogeneity of CPS. I argue that such challenges can be addressed by leveraging concepts that have been instrumental in fostering electronic design automation while dealing with complexity in VLSI system design. Based on these concepts, I introduce a design methodology whereby platform-based design is combined with assume-guarantee contracts to formalize the design process and enable realization of CPS architectures and control software in a hierarchical and compositional manner. I conclude my presentation with a view of where CPS are headed: bio-cyberphysical systems and swarm systems.

Biography: Alberto Sangiovanni Vincentelli holds the Edgar L. and Harold H. Buttner Chair of Electrical Engineering and Computer Sciences at the University of California at Berkeley. He has been on the Faculty of the Department since 1976. He obtained an electrical engineering and computer science degree (“Dottore in Ingegneria”) *summa cum laude* from the Politecnico di Milano, Milano, Italy in 1971. In 1980-1981, he spent a year as a Visiting Scientist at the Mathematical Sciences Department of the IBM T.J. Watson Research Center. In 1987, he was Visiting Professor at MIT. He has held a number of visiting professor positions at Italian Universities. He is a member of the Advisory Board of the Lester Center for Innovation of the Haas School of Business and of the Center for Western European Studies and is a member of the Berkeley Roundtable of the International Economy (BRIE). He is an author of over 850 papers, 18 books and 2 patents in the area of design tools and methodologies, large scale systems, embedded systems, hybrid systems and innovation.

He was the founder and Scientific Director of the Project on Advanced Research on Architectures and Design of Electronic Systems (PARADES), a European Group of Economic Interest located in Rome supported by Cadence, Magneti-Marelli and ST Microelectronics. He was a co-founder of the Advanced Laboratory for Embedded Systems (ALES) that acquired PARADES. In 2013, ALES was acquired by United Technologies Corporation.

Alberto is a member of many boards of directors including Cadence, KPIT Technologies, Expert Systems, and Sonics. He has been on the Advisory Board of companies such as ST Microelectronics, HP, GM, and UTC to name a few. In addition, he consulted for many companies including Bell Labs, DEC, IBM, Intel, TI, COMAU, Magneti Marelli, Pirelli, BMW, Daimler, ST, Fujitsu, Kawasaki Steel, Sony, and Hitachi. He was an advisor to the Singapore Government for microelectronics and new ventures, is a member of the High-Level Group, of the Steering Committee, of the Governing Board and of the Public Authorities Board of the EU Artemis Joint Technology Initiative. Since July 2012, he has been named Chairperson of the Comitato Nazionale Garanti per la Ricerca, a seven person committee established by the Ministry of Education, Scientific Research and University of the Italian Government to oversee the evaluation processes for research in Italy.

Alberto had received many major honors including Kaufman Award of the Electronic Design Automation Council for “pioneering contributions to EDA”, IEEE/RSE Wolfson James Clerk Maxwell Medal “*for groundbreaking contributions that have had an exceptional impact on the development of electronics and electrical engineering or related fields*”, the first ACM/IEEE A. Richard Newton Technical Impact Award in Electronic Design Automation, Lifetime Achievement Award from EDAA and has been a Fellow of the IEEE since 1982 and a Member of the National Academy of Engineering since 1998.

In addition, in 1981, he received the Distinguished Teaching Award of the University of California and the Graduate Teaching Award for inspirational teaching of graduate students of the IEEE in 1995. In 2002, he was the recipient of the Aristotle Award of the Semiconductor Research Corporation for “outstanding teaching in its broadest sense, emphasizing student advising and teaching during the research project”.

In 2012, he was given an Honorary Doctorate from KTH in Sweden and in 2015, a Doctorate Honoris Causa from University of Cracow, Poland.