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ELECTRICAL & COMPUTER ENGINEERING
TEXAS A&M UNIVERSITY

S E M I N A R

Room 1035 ETB

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Advances and Trends in CMOS Analog and RF Integrated Circuits

by

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Abstract: Although the basic concept of switched-capacitor circuits was envisioned by James Clerk Maxwell in 1873 in his *A Treatise on Electricity and Magnetism*, it lay dormant for nearly a century until David L. Fried's 1972 IEEE JSSC paper: *Analog Sampled-data Filters*. The techniques were introduced to the semiconductor industry in 1976 owing to the visionary research of Profs. David A. Hodges, Paul R. Gray and Robert W. Brodersen at UC Berkeley and their identification of the killer "app"—the conversion of the telephone system from analog to digital. Consequently, the switched-capacitor technique has been used in high-volume data converters and signal processing ICs for nearly four decades. It is also critical to RF transceiver circuits and future killer applications including massive MIMO radios, biomedical circuits and systems, brain-machine interfaces, etc.

Despite its middle age, the field of CMOS analog and RF integrated circuits is entering a new era of energy-efficient/energy-harvested swarms of sensors, hundreds of communication devices per human, etc., associated with the Internet-of-Things vision. Future mixed-signal systems will be designed using advanced FINFET or SOI processes in addition to conventional CMOS technologies. Switched-capacitor circuits along with the emerging ring amplifier techniques are critical to implementing this vision. Some examples relating to the IOT vision will be described in this talk including efficient data compression and power transmission as well as advanced signal processing techniques using n-path techniques along with ring-amplifier structures.

David J. Allstot received the B.S., M.S., and Ph.D. degrees from the Univ. of Portland, Oregon State Univ., and the Univ. of California, Berkeley.
He has held several industrial and academic positions. He was the Boeing-Egtvedt Chair Professor of Engineering at the Univ. of Washington from 1999 to 2012 and Chair of the Dept. of Electrical Engineering from 2004 to 2007. In 2012 he was a Visiting Professor of Electrical Engineering at Stanford University and since 2013 he is the MacKay Professor in Residence in the EECS Dept. at UC Berkeley.
Dr. Allstot has advised approximately 65 M.S. and 40 Ph.D. graduates, published more than 300 papers, and received several awards for outstanding teaching and research including the 1980 IEEE W.R.G. Baker Award, 1995 and 2010 IEEE Circuits and Systems Society (CASS) Darlington Award, 1998 IEEE International Solid-State Circuits Conference (ISSCC) Beatrice Winner Award, 2004 IEEE CASS Charles A. Desoer Technical Achievement Award, 2005 Semiconductor Research Corp. Aristotle Award, 2008 Semiconductor Industries Assoc. University Research Award, 2011 IEEE CASS Mac Van Valkenburg Award, and 2015 IEEE Trans. on Biomedical Circuits and Systems Best Paper Award. He has been active in service to the IEEE Circuits and Systems and Solid-State Circuits Societies throughout his career.

There will be PIZZA. Please RSVP with Ella Gallagher