

Presents the Spring 2013 EECS Seminar Series

Dr. Ahmad Mirzaei
Broadcom Corporation

“Reconfigurable Fully-Integrated RF Receiver Front-Ends”
Wednesday, April 17, 2013 • 2:00 p.m. • HEC 450

ABSTRACT

In wireless receivers, strong out-of-band interferers may accompany the weak desired signal. These interferers must be filtered out prior to reaching the Low-Noise Amplifier (LNA) to avoid gain compression. Due to the limited quality factor (Q) of on-chip inductors, the out-of-band filtering is traditionally attained by off-chip Surface Acoustic Wave (SAW) components. SAW filters are expensive and bulky and since they are not tunable, in multiband applications one filter must be dedicated for each radio standard. With the widespread applications of multiband wireless systems, replacing SAW filters by on-chip counterparts has become the long-pursued goal among circuit designers.

In this talk, I introduce integrated N-phase filters to replace external SAW filters in wireless receivers. N-phase filters can frequency-translate baseband impedances to synthesize high-Q bandpass filters with center frequencies precisely controlled by the Local Oscillator (LO) clock. The clock-tunable center frequency of the N-phase filters enables fully-integrated reconfigurable receiver architectures for multi-band applications. Composed of only Metal-Oxide-Semiconductor (MOS) switches and capacitors, these filters are ideal for integration and they follow the technology scaling. Using these filters, we recently showed fully-integrated reconfigurable receiver architectures for multi-band multi-mode applications.

BIOGRAPHY

Ahmad Mirzaei received his B.Sc and M.Sc degrees with honors from Sharif University of Technology, Tehran, Iran, and the Ph.D. degree from the University of California, Los Angeles, all in Electrical Engineering. He has been with Broadcom Corporation, Irvine, CA since 2007, where he is currently a Sr. Principal Scientist at the RF research and development group working on the development of the next generation low-power and multi-band radios. He is the author and coauthor of over 40 peer-reviewed journal and conference papers, and two books. He holds over 45 issued/pending patent applications in the field of RF-CMOS. His interests include analog and RF IC design for wireless communications.