

UNIVERSITY OF MACAU
FACULTY OF SCIENCE AND TECHNOLOGY

Distinguished Lectures on Microelectronics by World-Leading Expert
A NEW CALIBRATION TECHNIQUE FOR CMOS ADCs

Date and Time: 18th June 2009 (Thursday), 11:00 AM – 12:00 PM
Venue: Room HG03, Ho Yin Convention Centre,
University of Macau

Prof. Behzad Razavi
University of California, Los Angeles

Abstract: The design of high-speed, high-resolution analog-to-digital converters (ADCs) continues to present greater challenges as the device dimensions and supply voltages are scaled down. While generic issues such as capacitor mismatch provided the impetus for earlier calibration techniques, deep-submicron low-voltage technologies have made it increasingly difficult to realize high-gain op amps, requiring additional calibration that corrects for gain error and nonlinearity. With the declining intrinsic gain of transistors, it is expected that the notion of fast-settling, low-voltage, high-gain op amps will eventually become extinct.

This presentation introduces a new digital calibration scheme that enables a resolution of 10 bits in pipelined ADCs with an open-loop op amp gain of only 25. The calibration corrects for capacitor mismatch, residue gain error, and op amp nonlinearity, leading to the fastest single-channel 10-bit ADC reported in CMOS technology with a power consumption of 55 mW.



Biography: Behzad Razavi is Professor of Electrical Engineering at UCLA, where he conducts research on wireless and wireline transceivers, phase-locking phenomena, and data converters.

Professor Razavi has received numerous awards for his research and teaching, including the Beatrice Winner Award for Editorial Excellence at the 1994 ISSCC, the best paper award at the 1994 European Solid-State Circuits Conference, the best panel award at the 1995 and 1997 ISSCC, the TRW Innovative Teaching Award in 1997, and the best paper award at the IEEE Custom Integrated Circuits Conference in 1998. He and his students received both the Jack Kilby Outstanding Student Paper

Award and the Beatrice Winner Award for Editorial Excellence at the 2001 ISSCC. He was also recognized as one of the top 10 authors in the 50-year history of ISSCC and received the Lockheed Martin Excellence in Teaching Award in 2006 and the UCLA faculty Senate Teaching Award in 2007.

Professor Razavi is an IEEE Distinguished Lecturer, a Fellow of IEEE, and the author of Principles of Data Conversion System Design (IEEE Press, 1995), RF Microelectronics (Prentice Hall, 1998) (translated to Chinese and Japanese), Design of Analog CMOS Integrated Circuits (McGraw-Hill, 2001) (translated to Chinese and Japanese), Design of Integrated Circuits for Optical Communications (McGraw-Hill, 2003), and Fundamentals of Microelectronics (Wiley 2006) (translated to Korean), and the editor of Monolithic Phase-Locked Loops and Clock Recovery Circuits (IEEE Press, 1996), and Phase-Locking in High-Performance Systems (IEEE Press, 2003).

The lectures are open to the public

For enquiry:

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