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**ELECTRICAL & COMPUTER
ENGINEERING**
TEXAS A & M UNIVERSITY

SEMINAR

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Recent Advances in A/D Converter Design at Advanced CMOS Nodes

by

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Abstract: The continued scaling of CMOS process technology continues to provide benefits in terms of ever increasing digital circuit functionality, smaller form factors, reduction in power consumption and cost. This is the major driving force behind advances in consumer electronics, whereby entire systems can be integrated into System-on-chip (SOC). However, compared to their digital counterparts, analog circuits do not benefit from technology scaling. This has particularly made designing high dynamic range analog circuits more difficult at advanced nodes, mainly due to the reduction in power supply voltage, degraded analog transistor characteristics, including short-channel-effects, increased flicker noise, random telegraph noise and poor passive component performance. Analog-to-Digital Converters (ADCs) act as the interface between the real analog world and the digital world. This seminar will review new and emerging architectural and design techniques that seek to address the challenges of high resolution and low distortion ADCs at advanced nodes. Of particular interest are hybrid architectures that advantageously combine the benefits of existing classical architectures to yield improved performance.

Dr. Martin Kinyua received the B.S. degree from the University of Nairobi in 1992, the M.S. degree from Texas Tech University in 1997 and the Ph.D. from SMU, Dallas, TX, in 2004, all in Electrical Engineering.

From 1997 to 2007, he was with Texas Instruments, Inc., Dallas, as a Mixed Signal Designer working primarily on high speed and high resolution Data Converters for wireless infrastructure and Audio applications. Since 2008, he has been with TSMC Technology Inc., in Austin, TX, as a R&D Technical Manager and Designer. His research interests include low noise Data conversion circuits and techniques for high speed applications, Delta-Sigma converters for Audio Applications, Class-D Amplifiers, low noise CMOS image sensor readout circuits and power management circuits. He has 32 patents issued or pending.