SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
Faculty of Engineering
Website: http://www.ece.nus.edu.sg

Area: Integrated Circuits and Embedded Systems
Host: Prof. Massimo Alioto

TOPIC	**From Nanodevices to Nanosystems: Carbon Nanotube N3XT Information Technology**
SPEAKER	**Prof. Subhasish Mitra** **Stanford University**
DATE	**26 June 2015, Friday**
TIME	**12:00 pm to 1:30 pm (lunch will be provided, please register at *http://doodle.com/342ggg7ucnv9cbid*)**
VENUE	**E5-03-23 (Engineering Blk E5, Faculty of Engineering, NUS)**

ABSTRACT

Carbon Nanotube Field-Effect Transistors (CNFETs) can revolutionize the design of highly energy-efficient future electronic systems. Unfortunately, carbon nanotubes (CNTs) face major obstacles such as substantial imperfections and variations inherent to CNTs, and low CNFET current densities.
A combination of CNFET circuit design and CNT processing techniques (the "imperfection-immune paradigm") overcomes these challenges to enable the experimental demonstration of the carbon nanotube computer, and, more generally, arbitrary CNFET digital systems. These are the first system-level demonstrations among promising emerging nanotechnologies for high-performance and highly energy-efficient digital systems.
We will also discuss new nanosystem architectures enabled by monolithic three-dimensional (3D) integration of CNFETs and emerging memories. Such fine-grained 3D integration allows for computation immersed in memory, and is key to achieving very high degrees of energy efficiency for emerging abundant-data applications.
This research was performed at Stanford University in collaboration with Prof. H.-S. Philip Wong and several graduate students.

BIOGRAPHY

Professor Subhasish Mitra directs the Robust Systems Group in the Department of Electrical Engineering and the Department of Computer Science of Stanford University, where he is the Chambers Faculty Scholar of Engineering. Before joining Stanford, he was a Principal Engineer at Intel.
Prof. Mitra's research interests include robust systems, VLSI design, CAD, validation and test, emerging nanotechnologies, and emerging neuroscience applications. His X-Compact technique for test compression has been key to cost-effective manufacturing and high-quality testing of a vast majority of electronic systems, including numerous Intel products. X-Compact and its derivatives have been implemented in widely-used commercial Electronic Design Automation tools. His work on carbon nanotube imperfection-immune digital VLSI, jointly with his students and collaborators, resulted in the demonstration of the first carbon nanotube computer, and it was featured on the cover of NATURE. The NSF presented this work as a Research Highlight to the US Congress, and it also was highlighted as "an important, scientific breakthrough" by the BBC, Economist, EE Times, IEEE Spectrum, MIT Technology Review, National Public Radio, New York Times, Scientific American, Time, Wall Street Journal, Washington Post, and numerous other organizations worldwide.
Prof. Mitra's honors include the Presidential Early Career Award for Scientists and Engineers from the White House, the highest US honor for early-career outstanding scientists and engineers, ACM SIGDA/IEEE CEDA A. Richard Newton Technical Impact Award in Electronic Design Automation, "a test of time honor" for an outstanding technical contribution, and the Intel Achievement Award, Intel's highest corporate honor. He and his students published several award-winning papers at major venues: IEEE/ACM Design Automation Conference, IEEE International Solid-State Circuits Conference, IEEE International Test Conference, IEEE Transactions on CAD, IEEE VLSI Test Symposium, Intel Design and Test Technology Conference, and the Symposium on VLSI Technology.