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## Distinguished Lecturer Series



### Prof. Kamran Eshraghian

President of Innovation Laboratories, Australia

Distinguished Professor at WCU, College of Electrical & Electronic Engineering

## The reality of nanoscale devices as part of future system on system (SoS)integration

The convergence of significantly different and disparate technologies such as spintronics, carbon nano tube field effect transistors (CNFET), metamaterials, photon and bio-responsive molecular switches, and memristor and memristive systems, coupled with energy scavenging sources are gaining a renewed focus in the quest for new products. In late 80s Carver Mead introduced the concept of Neuromorphics within the context of VLSI systems that contained circuitry that could emulate neuro-biological architectures. The interesting feature of this design domain is the approach towards formulation of architectures based on features that characterize biological nervous systems. While the future is becoming more difficult to predict, most likely we could anticipate an accelerating pace of change that spans across intelligent health care and health related sciences, environmental management, and smart energy through to new innovations in new-IT and man-machine interaction and communications brought about as the result of new and disruptive technologies.

This lecture will highlight the inevitability of 3D *Hyperintegration* using technologies that are either in their infancy or those yet to be uncovered through initiatives of material physicists, computational chemists, and bioengineers and will focus upon one such technology - *Memristor* (Memory-Resistor) - the 4<sup>th</sup> electronic component conjectured to challenge the perspective and the mind-set that researchers and industry currently may have.

Kamran Eshraghian received his B.Tech., M.Eng.Sc., and Ph.D., degrees from the University of Adelaide, South Australia. In 2004 he was awarded the Dr.-Ing e.h., from the University of Ulm, Germany, for his research into integration of nanoelectronics with that of light wave technology. He is best known in international arena as being one of the fathers of CMOS VLSI having influenced two generations of researchers in both academia and industry. In 1979, he joined the Department of Electrical and Electronic Engineering at the University of Adelaide, South Australia, after spending some ten years with Philips Research, both in Australia and Europe. In 1994, he was invited to take up the Foundation Chair of Computer, Electronics and Communications Engineering in Western Australia, and became Head of School of Engineering and Mathematics, and Distinguished University Professor and subsequently became the Director of Electron Science Research Institute. In 2004 he became founder/President of Elabs as part of his vision for horizontal integration of nanoelectronics with those of bio and photon-based technologies, thus creating a new design domain for System on System (SoS) integration. Currently he is the president of Innovation Labs and also serves as the Chairman of the Board of Directors of two high technology companies. In 2007 he was the holder of inaugural Ferrero Family Chair in Electrical Engineering and visiting Professor of Engineering at University of California Merced prior to his move in 2009 to Chungbuk National University, Korea, as Distinguished Professor, World Class University (WCU) program. He has co-authored six textbooks and has lectured widely in very large scale integrated and multitechnology systems. He has founded six high technology companies, providing intimate links between university research and industry. Prof. Eshraghian is a Fellow and life member of the Institution of Engineers, Australia.

11:00-12:00 on Sunday, 19 June, 2011—Saal Auditorium, Alon Bldg (37/202)  
12:00-11:00 א' ביוני—באודיטוריום סאל בבנין אלון (202/37)