Abstract
In the era of the nanometer CMOS technology, due to stringent system requirements in power, performance and other fundamental physical limitations (such as mechanical reliability, thermal constraints, overall system form factor, etc.), future VLSI systems are relying more on ultra-high data rates (up to 100Gbps/pin or 20Tbps aggregate), scalable, re-configurable, highly compact and reliable interconnect fabric. To overcome such challenges, we first explore the use of multiband RF/Wireless-Interconnects which can communicate simultaneously through multiple frequency bands with low power signal transmission, reconfigurable bandwidth and excellent mechanical flexibility and reliability. We then review recent advances in RF/Wireless-Interconnect in four different potential application domains, which include Network-on-Chips (NoCs), 3-dimensional integrated circuit (3DIC), advanced memory interface and ultra-high speed contactless connectors. Based on those developments, we further propose the future research direction on future inter- and intra-VLSI interconnect system through the comparison of performance and the proper communication range for all three types of interconnects, including communication data throughput, range and power consumption (pJ/bit) among the RF/Wireless-Interconnects, the optical interconnects and traditional parallel repeated bus.

Biography
Dr Sai-Wang (Rocco) Tam was born in Hong Kong. He received his B.Sc., M.Sc. and Ph.D. degree in electrical engineering from the University of California, Los Angeles, in 2003, 2008 and 2009, respectively. His current research interests include high speed mixed-signal circuits, mm-wave circuits, high speed A/D, RF-interconnect and network-on-chip. He has been published over 15 conference papers/journals and 1 book chapter. Dr. Tam recent paper “CMP Network-on-chip Overlaid with Multiband RF-Interconnect” was selected for the Best Paper Award in 2008 IEEE International Symposium on High-Performance Computer Architecture (HPCA).