SEMINAR

An introduction to on-chip interconnection networks and many-core single-chip computer architectures

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Abstract
In this talk I will give an introduction to on-chip interconnection networks, the networks which have traditionally formed the communication medium in high-end parallel systems such as clusters, server blades, terabit internet routers, and supercomputers. With advancements in process technologies and the critical need to keep up with Moore’s Law, these fabrics have in recent times been replacing dedicated wiring and crossbar connections. Interconnection networks have recently been deployed into smaller-scale parallel systems found on a single chip such as chip multiprocessors (CMPs), multi-processors systems-on-a-chip (MPSoCs) and many-core systems-on-a-chip (SoCs), in the form of on-chip networks or networks-on-chip (NoCs). During the talk I will introduce basic concepts of interconnection networks, such as router microarchitectures, routing algorithms, flow control protocols, virtual channels and virtual networks etc. Finally, I will give an overview of leading chip-multiprocessor and many-core systems-on-a-chip architectures that incorporate these networks as communication fabrics, and discuss the interaction between the software, parallelizing compilers and the underlying modular hardware, by referring to recently implemented architectures from both the industry and the academia.

About the Speaker
Vassos Soteriou received his B.Sc. degree from Rice University in Houston, Texas in 2001 and his Ph.D. from Princeton University in New Jersey in 2006, all in electrical engineering. From 2000 to 2004 he held internship positions at Micron Technology (DRAM), Texas Instruments (DSP) and at the IBM Research Center in Zurich (Systems). His is a recipient of a best paper award at the 2004 IEEE International Conference on Computer Design. He received a Teaching Assistant Award in 2003 at Princeton for helping teach “Advanced Computer Architecture”. He is currently working as a visiting lecturer at the University of Cyprus, where he teaches courses in computer organization and microprocessors. His research interests lie in computer architecture, interconnection networks, multi-core on-chip architectures and embedded processors, with emphasis on power consumption reduction methodologies, efficient simulation and design exploration.

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