Colorado State University's
Information Science and Technology Center (ISTeC)
presents two lectures by

Dr. Chita Das

Distinguished Professor of
Computer Science and Engineering,
Pennsylvania State University

ISTeC Distinguished Lecture
in conjunction with the
Electrical and Computer Engineering Department and
Computer Science Department Seminar Series

"Challenges and Opportunities in Computer Architecture Research"

Monday, October 15, 2012
Reception: 10:30 a.m.
Lecture: 11:00 – 12:00 noon
Location: Lory Student Center room 213-5

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"Role of Network-on-Chips (NoCs) in Designing Multicore Architectures"

Monday, October 15, 2012
Lecture: 3:30 p.m. – 4:30 p.m.
Location: Engineering B205

ABSTRACTS

"Challenges and Opportunities in Computer Architecture Research"

Computer architecture has played a foundational role in enabling the IT infrastructure for last several decades and has aptly done so by riding on the Moore's law for designing better processor architectures to meet the application requirements. However, it is believed that the current Von Neumann architectural foundation that was adopted more than 50 years ago, has probably reached its limits in fueling the modern IT growth. This is primarily attributed to the limitations of the current microarchitectures in satisfying the performance, power, reliability and security requirements.

In this talk, we will focus on the architectural challenges from the application, technology and state-of-the-art design perspectives, and discuss how computer architects can address these challenges with a holistic design paradigm spanning hardware, software, application and technology. The talk will reemphasize the need for transformative research in computer architecture for sustaining the IT growth with next generation mobile, desktop and ware-house scale computers.

"Role of Network-on-Chips (NoCs) in Designing Multicore Architectures"

The integration of multiple cores on the same chip has signaled the beginning of communication-centric, rather than computation-centric systems. Further, technology trends have accentuated the importance of interconnect-conscious design as global wire delays do not scale down as fast as gate delays in new technologies. Consequently, on-chip interconnects, also known as network-on-chip (NoC) architectures, are predicted to be a major bottleneck in designing multi-core and System-on-Chip (SoC) architectures. Unlike the traditional multiprocessor interconnects, design of NoC architectures poses a whole set of new challenges in terms of on-chip area budget, energy efficiency, and reliability.

This talk will provide a comprehensive overview of the NoC design space. I will discuss a variety of contemporary NoC designs aimed at optimizing one or more parameters. Specifically, I will summarize some of our current efforts on application-driven NoC design and will provide pointers to many NoC research issues blended with emerging technologies such as 3D, optics and STT-RAM.

SPEAKER BIOGRAPHY

Chita Das is a Distinguished Professor of Computer Science and Engineering at the Pennsylvania State University. His main areas of interest include parallel and distributed computer architectures, multi-core architectures, mobile computing, performance evaluation, and fault-tolerant computing. In particular, he has worked extensively in the area of design and analysis of interconnection networks/on-chip interconnects. He has published more than 180 papers in the above areas, has received several best paper awards, has served on many program committees, and editorial boards. He is a Fellow of the IEEE.

To arrange a meeting with the speaker, please contact **Prof. Sudeep Pasricha** at sudeep@ColoState.EDU or (970)491-0254.

ISTeC (Information Science and Technology Center) is a university-wide organization for promoting, facilitating, and enhancing CSU's research, education, and outreach activities pertaining to the design and innovative application of computer, communication, and information systems. For more information please see ISTeC.ColoState.edu.