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**THE DEPARTMENT OF COMPUTER SCIENCE & THE COMPUTER SCIENCE
GRADUATE STUDENT ORGANIZATION (GSOCS) PRESENT**

INVITED SPEAKER SERIES
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Wednesday, September 27th at 12 noon, Lecture Hall 7

A Cross-layer Approach to Accelerating Heterogeneous Computing

Abstract: GPU computing is alive and well! The GPU has allowed researchers to overcome a number of computational barriers in important problem domains. But still, there remain challenges to use a GPU to target more general purpose applications. GPUs achieve impressive speedups when compared to CPUs, since GPUs have a large number of compute cores and high memory bandwidth. Recent GPU performance is approaching 10 teraflops of single precision performance on a single device. In this talk we will discuss current trends with GPUs, including some advanced features that allow them exploit multi-context grains of parallelism. Further, we consider how GPUs can be treated as cloud-based resources, enabling a GPU-enabled server to deliver HPC cloud services by leveraging virtualization and collaborative filtering. Finally, we argue for for new heterogeneous workloads and discuss the role of the Heterogeneous Systems Architecture (HSA), a standard that further supports integration of the CPU and GPU into a common framework. We present a new class of benchmarks specifically tailored to evaluate the benefits of features supported in the new HSA programming model.
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Bio: David Kaeli received his BS and PhD in Electrical Engineering from Rutgers University, and an MS in Computer Engineering from Syracuse University. He served as the Associate Dean of Undergraduate Programs for the College of Engineering and is presently a COE Distinguished Full Processor on the ECE faculty at Northeastern University, Boston, MA. He is the Director of the Northeastern University Computer Architecture Research Laboratory (NUCAR). Prior to joining Northeastern in 1993, Kaeli spent 12 years at IBM, the last 7 at T.J. Watson Research Center, Yorktown Heights, NY.

Dr. Kaeli has published over 300 critically reviewed publications, 7 books, and 13 patents. His research spans a range of areas including microarchitecture to back-end compilers and big data applications. His current research topics include graphics processors, hardware/software security, virtualization, heterogeneous computing and multi-layer reliability. He serves as an Associate Editor of the IEEE Transactions on Parallel and Distributed Systems, the ACM Transactions on Computer Architecture and Code Optimization, and the Journal of Parallel and Distributed Computing. Dr. Kaeli an IEEE Fellow and an ACM Distinguished Scientist.