UNCLASSIFIED

Information Science and Technology Seminar Speaker Series

Wu Feng
Virginia Tech

An Ecosystem for the New HPC: Heterogeneous Parallel Computing

Wednesday, July 22, 2015

3:00 - 4:00 PM

TA-3, Bldg. 1690, Room 102 (CNLS Conference Room)

Abstract: With processor core counts doubling every 24 months and penetrating all markets from high-end servers in supercomputers to desktops and laptops down to even mobile phones, we sit at the dawn of a world of ubiquitous parallelism, one where extracting performance via parallelism is paramount. That is, the "free lunch" to better performance, where programmers could rely on substantial increases in single-threaded performance to improve software, is over. The burden falls on developers to exploit parallel hardware for performance gains. But how do we lower the cost of extracting such parallelism, particularly in the face of the increasing heterogeneity of processing cores? To address this issue, this talk will present a vision for an ecosystem for delivering accessible and personalized supercomputing to the masses, one with a heterogeneity of (hardware) processing cores on a die or in a package, coupled with enabling software that tunes the parameters of the processing cores with respect to performance, power, and portability. Initial results of different aspects of the ecosystem will be demonstrated via a benchmark suite of computational dwarfs and applications on platforms ranging from the embedded or mobile space to the datacenter, such as Virginia Tech's very own GPU-accelerated supercomputer, HokieSpeed, which debuted on the Green500 as the most energy-efficient (i.e., greenest) commodity supercomputer in the U.S. and at a fraction of the cost of the fastest supercomputer in the world.

Biography: Wu Feng is the Elizabeth & James Turner Fellow and Professor of Computer Science at Virginia Tech (VT), where he directs the Synergy Lab and serves as the director of the Synergistic Environments for Experimental Computing (SEEC) Center and a VT site co-director of the National Science Foundation Center for High-Performance Reconfigurable Computing (CHREC). In addition, he holds appointments in the Department of Electrical & Computer Engineering, Health Sciences, and Virginia Bioinformatics Institute. Dr. Feng received a Ph.D. in Computer Science from the University of Illinois at Urbana-Champaign in 1996.

For more information contact the technical host Curt Canada, cvc@lanl.gov, 665-7453.

Hosted by the Information Science and Technology Institute (ISTI)

Los Alamos NATIONAL LABORATORY EST. 1943

ISTI INFORMATION SCIENCE & TECHNOLOGY INSTITUTE