USC Viterbi School of Engineering Ming Hsieh Department of Electrical Engineering

Seminar Announcement

Ming Hsieh Institute
Ming Hsieh Department of Electrical Engineering

EE 598 Computer Engineering Seminar Series

Vivek Sarkar
E.D. Butcher Chair in Engineering
Rice University

Software Challenges for Extreme Scale Systems, or how to play the End-Game for Moore's Law

Thursday, October 6, 2016
OHE 100D
4:00 – 5:00PM

It is widely recognized that a major disruption is under way in computer hardware as processors strive to extend the end-game of Moore's Law by an increased reliance on parallelism and heterogeneity, leading to systems with thousands/millions/billions of processor cores at the node/rack/data-center levels. Unlike previous generations of hardware evolution, these "extreme scale" systems will have a profound impact on future software.

In this talk, we summarize experiences gained in the Habanero Extreme Scale Software Research Laboratory at Rice University in addressing the software challenges for extreme scale systems. Our overall approach is based on introducing a set of unified primitives for structured parallelism, which can be used to enable new advances in programming models, compilers, and runtime systems for future hardware. Some of these primitives have already influenced industry standards for parallelism including the doacross construct in OpenMP 4.5, the task blocks library for C++, and Java's Phaser library, as well as the open source Open Community Runtime (OCR) system project.

Vivek Sarkar is Professor and Chair of Computer Science at Rice University. He currently leads the Habanero Extreme Scale Software Research Laboratory at Rice University, and is PI of the DARPA-funded Pliny project on "big code" analytics. Prior to joining Rice in July 2007, Vivek was Senior Manager of Programming Technologies at IBM Research. His research projects at IBM included the X10 programming language, the Jikes Research Virtual Machine for the Java language, the ASTI optimizer used in IBM's XL Fortran product compilers, and the PTRAN automatic parallelization system. Vivek became a member of the IBM Academy of Technology in 1995, the E.D. Butcher Chair in Engineering at Rice University in 2007, and was inducted as an ACM
Fellow in 2008. Vivek has been serving as a member of the US Department of Energy's Advanced Scientific Computing Advisory Committee (ASCAC) since 2009, and on CRA's Board of Directors since 2015.

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