

**DEPARTMENT OF COMPUTER SCIENCE  
UNIVERSITY OF HOUSTON  
FACULTY CANDIDATE SEMINAR 2012**

**WHEN: FRIDAY, APRIL 6, 2012**  
**WHERE: PGH 232**  
**TIME: 11:00 AM**

**SPEAKER:** Dr. Sally A. McKee, Chalmers University of Technology

Host: Dr. Barbara Chapman

**TITLE:** Portable, Scalable, per-Core Power Estimation for Intelligent Resource Management

**ABSTRACT:** Power and temperature have joined performance as first-order design constraints. Balancing power efficiency, thermal constraints, and performance requires some means to convey data about real-time power consumption and temperature to intelligent resource managers. Resource managers can use this information to meet performance goals, maintain power budgets, and obey thermal constraints. Unfortunately, obtaining the required machine introspection is challenging. Most current chips provide no support for per-core power monitoring, and when support exists, it is not exposed to software.

We present a methodology for deriving per-core power models using sampled performance counter values and temperature sensor readings. We develop accurate, application-independent models for several CMPs, and show how they can be used to guide scheduling decisions in power-aware resource managers.

**BIO:** McKee received her bachelor's degree in Computer Science from Yale University (1985), masters from Princeton University (1990), and doctorate from the University of Virginia (1995). Her dissertation advisor is Bill Wulf, with whom she worked on memory systems architecture. Together they coined the now-common term the "memory wall" to describe a situation in which processors are always waiting for memory, and CPU performance is therefore entirely limited by memory performance.

Before graduate school, McKee worked for Digital Equipment Corporation and Microsoft Corporation. She has also held internships at Digital Equipment Corporation's Systems Research Center and the former AT&T Bell Labs. McKee worked as a Post-Doctoral Research Associate in the University of Virginia Computer Science Department for a year after graduating (waiting for the chip to come back from fab), and as a Computer Architect at Intel's Microcomputer Research Lab in Oregon for the two following years. During her time at Intel, McKee also taught at the Oregon Graduate Institute and Reed College. She was a Research Assistant Professor at the University of Utah's School of Computing from 1998-2002, where she worked on the Impulse Adaptable Memory Controller project. She was an assistant professor in Cornell University's Computer System Lab within the School of Electrical and Computer Engineering from 2002-2008. She is currently an Associate Professor of Computer Science and Engineering at Chalmers University of Technology in Gothenburg, Sweden.