Taming Heterogeneous Parallelism with Domain Specific Languages

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Seminar Series

Presented by…

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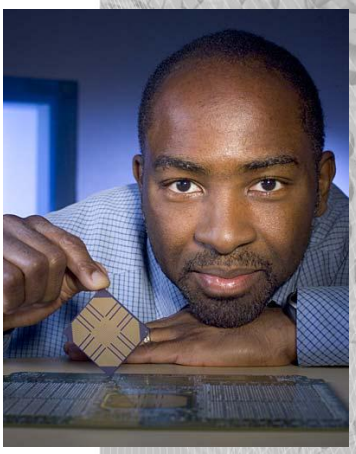

Abstract: Computing systems are becoming increasingly parallel and heterogeneous; however, exploiting the full capability of these architectures is complicated because it requires application code to be developed with multiple programming models. A much more productive single programming model approach to heterogeneous parallelism uses domain specific languages (DSLs). DSLs provide high-level abstractions which improve programmer productivity and enable transformations to high performance parallel code. In this talk, Professor Olukotun will motivate the DSL approach to heterogeneous parallelism; show example DSLs from the domains of graph analysis, mesh -based PDE solvers, and machine learning that provide both high productivity and performance; and describe Delite, a framework that simplifies the development of DSLs embedded in Scala.

Bio: Kunle Olukotun is a Professor of Electrical Engineering and Computer Science at Stanford University. Olukotun is best known as a pioneer in chip multiprocessor (CMP) design and the leader of the Stanford Hydra CMP research project. Olukotun founded Afara Websystems to develop high-throughput, low-power server systems with CMP technology. The Afara microprocessor, called Niagara, was acquired by Sun Microsystems. Niagara derived processors now power all Oracle SPARC-based servers. Olukotun currently directs the Stanford Pervasive Parallelism Lab (PPL) which seeks to proliferate the use of heterogeneous parallelism in all application areas using Domain Specific Languages (DSLs). Olukotun is an ACM Fellow and IEEE Fellow.

More info:
http://ogun.stanford.edu/~kunle/

February 14, 2012

EMSL Auditorium

1:00 pm