Power and Performance Characterization of Splash2 Benchmarks on Heterogeneous Architecture

Thursday, June 18, 2015
10:30 – 11:30 AM, ENGR 3202
All are invited to attend.

Committee
Dr. Houman Homayoun - Advisor
Dr. Brian Mark
Dr. Jim Jones

Abstract
The computing industry has constantly struggled between speed and power. To achieve the desired performance cores are becoming larger and more complicated. This of course comes at the cost of higher area and power consumption. An optimum configuration for any application must exist for peak performance and energy efficiency. This paper shows how such an optimization can be found using Splash2 benchmarks for demonstration. Sensitivity analysis was performed on each benchmark for multiple configuration parameters, particularly frequency, core type, and thread count. The resulting data was analyzed to determine what influence the parameters had on EDP for each benchmark. Finally, the benchmarks were instrumented in such a way as to highlight individual parallel regions to determine if alternative configurations are more appropriate for different regions of the applications, demonstrating the utility of a heterogeneous architecture.