Syllabus:
CS 5390: Advanced Systems and Architecture Topics
Summer 2014

Instructors:
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Class time and location:
TR 1:30-3:20pm, CCSB 1.0510

Course website: http://svmoore.pbworks.com

Course description:

This course focuses on advanced system-level architecture for systems ranging from mobile devices to warehouse-scale datacenters. It covers topics such as cache hierarchies, memory systems, non-volatile storage, virtualization, power management, and hardware-software co-design. Non-traditional and emerging architectures such as reconfigurable systems, logic-in-memory, and network computers are also of interest. Coursework will consist of reading and discussions of survey and research papers, as well as programming projects. The programming projects will provide an introduction to performance analysis and optimization techniques for computer systems. Objectives of the course are to understand organization of computer systems so as to be able to:

- analyze and evaluate computer systems with respect to performance, power consumption, and reliability
- discuss design tradeoffs in meeting system requirements
- evaluate emerging architectures

The course is intended for graduate students specializing in the field of computer systems who wish to understand and make efficient use of modern computer systems of various scales.

Tentative reading list:


Arkaprava Basu, Mark D. Hill, Michael M. Swift: Reducing memory reference energy with opportunistic virtual caching. ISCA 2012: 297-308


Exploiting Free Silicon for Energy-Efficient Computing Directly in NAND Flash-based Solid-State Storage Systems Peng Li, University of Minnesota; Kevin Gomez, Seagate Technology; David Lilja, University of Minnesota, HPEC’13, Waltham, MA, Sept. 2013

A High Performance and Memory Efficient LU Decomposer on FPGAs
Guiming Wu, Yong Dou, Junqing Sun, Gregory D. Peterson


