COMP 495 Mentored Research Contract

STUDENT INFORMATION

Name Sebastian Crowell

RESEARCH INFORMATION

Project description:

This project will cover instruction set design techniques (machine instruction and logic simplification) for nano-sized computation. Specifically, the research will include a small literature review had identfies the current trends in nanotechnology, then will apply those concepts of memory/space/bits and runtime/efficiency/stack to create the simplest (i.e. nano) nstructruction set (IS) possible that supports a small set of arthemtic and load/store operrations. Lastly, the developed nano-IS will be run in virtual nano-simulator and it's performane will be compared to traditional reduced insruction sets (e.g. MIPS or ARM).

Meeting requirements:

Monday, Wednesday, and Friday from 1 to 2 pm (to meet 3 credit hour criteria) in mentor's office loacted in the CS or Psyciatry deparment.

Reading assignments:

Various readings from textbooks: 1) Computer architecture (Patterson and Hennessy), 2) Superscaler and out-of-order design (Patterson and Hennessy), and 3) Pipelining and branch prediction (Patterson and Hennessy)

Various readings from academic papers: 1) Trends in nano-technologies and 2) nano-instruction set computers

Written assignments:

Bi-weekly progress reports, limited to 2 pages in length (unless otherwise noted), that describe what was: 1) learned, 2) implemented, and 3) tested. These writen assignments will be posted in a online collaboration tool (such as slack).

Software or hardware deliverables: (The deliverables should include the approximate scope and depth of work.)

At the conclusion of the project all the software and data will be uploaded to a repository (such as github) for future use/development. See assessment plan below.

Other assignments (e.g., presentations):

There will be a final project presentation and software demonstration. The location will be held in the CS or Pyschiatry department (or possbily both). See assessment plan below.

Assessment Plan:

Weekly meetings 20% of grade, Bi-weekly progress reports 20% of grade, Final presentation and demonstration 30% of grade, and Completed software application 30% of grade

Retention: This contract is to be retained for a minimum of four years. Last update: 30 August 2018