The goal of this project is for you to get in-depth experience in doing research on advanced computer architecture.[1] The topics may be closely related to the themes in the readings, or could be something completely different. A meta-goal is for you to learn how to organize, propose, execute, and present a research project. The expectation is that at the end of the semester, your work could be submitted to a workshop or conference, possibly with appropriate polishing.

1 Guidelines

You may work by yourself or with a partner on this project. Obviously, if you work with a partner, your combined project should be more ambitious than if you were working by yourself. You must discuss the project with me in office hours before writing your first proposal. Insufficient proposals will need to be rewritten.

2 Deliverables

For each delqiverable, you need to submit an electronic copy by email to `Sanjay.Rajopadhye@colostate.edu`.

2.1 D1: Preliminary Project Proposal [3%]

Due: September 17, 2013

The preliminary project proposal should be a few short paragraphs describing what problem you want to solve in your project, why it is important, what your approach will be, and how you expect to evaluate your approach. In addition, you should work out a simple example that illustrates what you plan to do.

2.2 D2: Detailed Project Proposal [5%]

Due: October 2, 2013

The proposal should elaborate on the preliminary proposal. It should contain the sme primary elements, a description of the problem you will solve, why it is important, your approach to solving the problem, the tools you will use, how you will evaluate your approach, and (this is new) a *detailed* time line for the project. You should also work out the example in more detail. For example, if your goal is to do design-space exploration (e.g., speed vs. energy) for alternative implementations of a multi-bank memory, you should first pick a few points in th design space, then work out, using

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[1] *This document was adapted from Michelle Strout's writeup for CS 653*

standard tools and libraries, the costs of these points. This may require, for example familiarity with VLSI design automation tools, and/or Verilog/VHDL or some appropriate hardware description language (HDL). The proposal should be no longer than 3 pages of text unless you are doing your project with a partner, in which case it can be up to 4 pages.

Unsatisfactory proposals will returned to the students for revision. You should plan to have extensive and regular meetings with Sanjay as you develop your proposal.

2.3   Oral Status Report [5%]

Due: October 22, 2013

Midway through the project, you will present to the class, your research problem, approach, and current status. Your verbal status report will be limited to five slides and 15 minutes. Included in the 15 minutes is time for the class to provide feedback and discuss any issues you may be having. The slide limit and time limit is strict. You will be graded on your presentation skills, therefore you should practice this talk ahead of time.

See the "How to Give a Talk" slides posted on the progress web page for an example progress report.

2.4   Intermediate Report [5%]

Due: October 29, 2013

One week after your presentation, you will submit a written report of your project status. At the time you write this document you should already have implemented a working prototype of any implementations you plan to do. This document should describe what you have built in detail and what challenges you faced in finishing it. You should also describe how you have tested the prototype. This document should be no more than 5 pages of text if you are working by yourself and no more than 7 pages if you are working with a partner.

2.5   Final and Poster (10% of course grade)

Due: December 12, 2013

The final report should be in the form of a 6-10 page conference paper (e.g., you could use the IEEE double-column latex format). As with a conference paper, the final report should describe and motivate the problem, present the approach, and evaluate the approach. Make sure that you answer all of the questions we have been asking about papers in our reviews when you write your own paper. When you submit this document, you should attach the "proposal" and "intermediate" documents to it.

During the finals time slot for this class (December 18, 2013 from 2:00-4:00pm), you will also be presenting a poster on your project.