ECE 497NC Project Guidelines

February 6, 2004

1 Introduction

The term project is the bulk of the workload in this course, and is worth 50% of the final grade. For the term project, you are expected to do new research in an area related to one or more of the topics of this course. By "new research," I mean that your term project should not be just a literature survey (though you'll want to do some amount of this in defining your project), and that it should not be purely a re-creation of work done elsewhere. Bringing relevant tools/experience from your thesis work to bear on this project is reasonable, and even encouraged, but there should be a clear separation between the work you are doing as part of your thesis and the work that you are doing as part of this course. For example, using your research group's simulation of a conventional processor architecture as a starting point for a study of how adding reconfigurable logic to the architecture would affect performance is completely valid. Implementing a minor change to the work that forms a chapter of your thesis is not.

Projects are expected to contain original research, although I certainly understand that the amount of research that is feasible within the context of a single class is limited. You are encouraged, but not required, to work in teams of 2-4 people. The number of people working on a project will be considered when the project is evaluated. Any division of effort that is acceptable to all members of the project team is fine, but all members of a project team will receive the same grade on the project.

2 Due Dates

There will be four "deliverables" that you will turn in over the course of the term, in order to provide me with an opportunity to give early feedback about your ideas and plans. The first deliverable will be a project outline, which will be due in class on 3/1. The project outline should be a two-page description of what you're interested in doing, listing some goals and the names of the project team members. It will be worth 5% of the project grade.

Deliverable two will be a 5-10 page design document for your project, which should outline the experiments you intend to run, the procedures/equipment you will use, and your plan for carrying out the work. It should also include a bibliography of the relevant previous work. The design document will be due in class on 3/29, and will be 25% of the project grade.

The final two deliverables are the project presentation and final report. The final report will be due in class on 5/5, and project presentations will be given in class from 4/26 to 5/5. Because project presentations will be spread over a two-week period, teams will be randomly assigned a presentation date. Presentation date assignments will be made at least two weeks before the start of presentations.

The format for both the final report and the project presentations will be based on the formats used at most research conferences. Final reports will be limited to a maximum of 12 pages, two-

column, single-spaced, with 10 point or larger fonts. This will be a strict limit, and overly-long papers will be penalized. In-class presentations will be 30 minutes each, organized as 25 minutes for the presentation and 5 minutes for questions. The final report will be worth 40% of the project grade, and the presentation 30%.

3 Project Suggestions

The potential scope of projects is very broad. In general, any topic related to any aspect of unconventional computing is fair game. If you have an idea that you're not sure fits into this definition, talk to me after class or send me an email about it as soon as possible.

To get you thinking, here are a number of topics that would make excellent projects:

- An analysis of the power/performance trade-offs involved in mapping applications onto a PIM system such as Active Pages.
- A study of how errors in the configuration bits of an FPGA affect program results.
- Developing algorithms to implement redundant circuits in reconfigurable logic.
- Developing a simulation framework for systems based on a non-silicon device that models device defects.
- Studying a set of applications to understand the affinity of routines in the applications to different types of processing resources.
- Fault-tolerant architectures for reconfigurable logic.
- Designs or ideas for programming languages that express locality

The project presentations from the last time this course was offered are linked at *http* : *//www.crhc.uiuc.edu/ece*497*nc/fall*01. Scroll down to the lectures that contained project presentations, and click on the names of the people presenting.

4 Available Resources

In addition to the workstations that the university maintains, there are some additional resources that are available. Disk space and accounts on the CRHCs computing facilities can be arranged if necessary. In addition, we have access to a small number of FPGA-based prototyping boards for any projects that could use such devices. There are also a moderate number of free/open source simulation tools available – talk to me if you might be interested in using one of these in your project.