Computer Architecture
EECE7352
Prof. Kaeli

Final Project description:

The assignment is to implement an architectural feature, or evaluate a code/data transformation, within a modeling infrastructure. The purpose of this assignment is to allow you practice some of the theory that has been presented in lecture. We have a very easy-to-use toolsets to implement your design on COE systems: Pin, Multi2Sim and Simplescalar. You can also use other simulation/profiling infrastructures. You can find a wealth of simulators and tools at:

http://www.cs.wisc.edu/arch/www/tools.html

For your project you should select a particular architectural feature (e.g., branch predictor, cache, value predictor, TLB) or code transformation (e.g., basic block layout), and you should implement it in the simulation framework. Then you will run programs (e.g., benchmarks) to evaluate the effectiveness of the studied feature.

Before starting the project, you should submit a project proposal, which includes the following information:

1. Problem you will study (e.g., study the impact of tagged prefetching on the cache hit rate).
2. Tools you will use in the study (e.g., Pin, M2S or Simplescalar).
3. Experiments you will run (e.g., 3 benchmarks, 12 different configurations)
4. The results you will generate, and the associated grade you would expect to receive. For example:

A = 3 benchmarks studied, 12 different configurations modeled, all results reported in project writeup.
A- = only 1 benchmark studied, 12 different configurations modeled, all results reported in project writeup.
B+ = only 1 benchmark studied, 6 different configurations modeled, all results reported in project writeup.
Etc…..

You can work in teams of 1, 2 or 3, but of course, a team of 2 should produce 2.5X as much output, and a team of 3 should produce 3.75X as much output. All team members will receive the same project grade. You will have the option of submitting your project to be presented in class. I reserve the right to ask any team member to present the presentation.

When you are done with your project, you should submit your completed project in a report. Your report should include the original proposal, as well as a well-written description of the work completed and analysis of the results obtained. We will try to leave time during the last class of the semester for students to give a 10-minute presentation on their project. This is not a required component of the project, but can add up to 10 points of extra credit.