CompArch: Final Project

The goal of the final project is for you to explore a topic of interest within Computer Architecture, driven by your personal learning goals. This could build on and extend something we discussed in class, or dive into some other area of Computer Architecture (broadly defined).

You may work in teams of any size, as long as they are appropriately scaled for your proposed project. Groups with > 4 members will face heavy skepticism about meeting this requirement.

In terms of scale, this is not a months-long capstone but rather more like an extended Lab. You will have about 2 weeks to complete it, and it will comprise 15% of your final grade. Be ambitious but realistic.

Timeline

- **Nov 19 (in class)** – project ideation and team formation fair
- **Nov 30 (in class)** – draft project proposal due[i], consultations with teams
- **Dec 1 by 5pm** – revised project proposal and work plan due
- **Dec 7** – mid-point check in (self-defined in work plan, highly recommended)
- **Dec 14** – final project due

Proposal (*10%)*

Your project proposal should be about 1-2 pages, and must include:

- Project title
- Team members
- Brief description of project (1-3 paragraphs)
- 2-3 references you plan to use
- Minimum, planned, and stretch deliverables
- Work plan (by Tuesday)

We will discuss your proposal in class on November 30 (first class after break). These meetings will be quick and to-the-point, so you must come prepared with a printed out copy of your proposal. You should have done some background research by this point and have a good idea of your planned project trajectory.

Based on the feedback from this meeting, you will revise your proposal and submit the final version the following day.

Documentation *(55%)*

The documentation counts for 55% of your grade whether you succeed at your goal or not. Did you shoot for the moon and land among the harsh vacuum of space? You still learned something from the process, and as long as you document it well, you will get full credit. Documentation should be posted in the form of a project website (PDF or MarkDown in a repo is acceptable) and must answer the following questions:

What did you do?

Your project abstract: one catchy sentence followed by a paragraph or two. The intended audience should include people that aren't necessarily versed in Computer Architecture, but are technically competent.

Why did you do it?

A paragraph or so about why the project you chose is worthwhile and interesting.

How did you do it?

This portion can assume an audience that has taken Computer Architecture, but don't let the story you're telling get bogged down by buzzwords. A sure sign of a bad engineer is ORA (over reliance on acronyms).

How can someone else build on it?

Include everything necessary to pick up where you left off. This should include:

- Code
- Schematics
- build instructions
- A list of difficulties and 'gotchas' while doing this project
- Work Plan reflection
- A possible TODO to extend the depth of the project

This should all be posted somewhere accessible, e.g. your project webpage or repository.

Choosing and Achieving your Goal *(30%)*

There is a **lot** of flexibility available in what your actual final project can be. As a first pass, it needs to satisfy the following criteria:

1) Build upon what we have learned in class this semester or other "Computer Architecture" topics
2) Have well defined criteria for when it is finished and successful.
3) Be achievable within the time allotted.

Possible broad directions:

1) Extending something you started in Computer Architecture
2) Teaching somebody something cool about Computer Architecture
3) Something useful to someone that uses Computer Architecture
4) Something that needs the skills learned in Computer Architecture
5) Something that you can present at Expo that will make people want to take Computer Architecture

Append one of the following phrases to a cool project idea to make it more CompArch-y:

1) … with an FPGA
2) … in assembly
3) … on a GPU
4) … inside a nested series of black boxes
5) … to make go screaming nasty fast.

As you put your project plans together, remember that a major portion of the project is communicating it to others.

Demo *(5%)*

We'll present your project work during the time blocked out for "final exam" period – December 15 from 12 – 3PM. This is mainly an opportunity to show off and celebrate your great work (small percentage of overall grade)

Good luck, and have fun!

[i] If you are interested in making forward progress on your final project over break, you may submit your draft proposal for feedback earlier than this