
Overview

For the last part of the semester, you are free to pursue a project of your own choosing. You may work with anyone you like, although please keep your group size to three people or less.

Possible topics include, but are not limited to, new language features, additional optimizations, a new back end for a different architecture, and so on. Pretty much anything related to programming languages and compilation is fair game. The scope of this project is roughly 2–2.5 weeks, so you should focus on a non-trivial, but not enormous, project.

Here are a few projects that come to mind:

- Add an exception handling mechanism to IC.
- Add Java-style interfaces to IC. Evaluate the performance penalties for using interface methods. Improve their performance by extending the IC run time to include polymorphic in-line caching.
- Add partial redundancy elimination and loop optimizations to your optimizer, and evaluate their performance.
- Implement low-level instruction selection and register allocation for basic blocks. That is, implement a tiling algorithm to replace your back end.
- Implement a garbage collector.
- Implement Class Hierarchy Analysis and measure its performance improvement.

There are many, many other options, depending on what you'd most like to learn more about. And if you are burned out on coding, a survey of literature on an appropriate topic is also perfectly fine. We can work to narrow down a topic that would be of interest to you

Schedule

Monday, Nov. 21: Come to the tutorial meetings with some ideas on what you'd like to do. We will narrow down the focus to something of the appropriate scale. After that meeting, I'll help you gather reading material and information on your topic.

Monday, Nov. 28, and Monday, Dec. 5: We'll spend parts of the tutorial meetings discussing the project design and implementation strategy. You should have a one page summary of the project prepared by Dec. 5, and be able to clearly articulate the goals and any code design for the project.

Monday, Dec. 12: This is during reading period. We can meet to discuss the project, as necessary.

Wed, Dec. 14: Project presentations.