Final Projects

Each student in 690LG will do a project in which he or she investigates a logic-and-cs topic more extensively than we cover in class, or a topic that we don't cover. This can be practical: learning a tool, or a pair of tools to compare: understanding how they work and putting them through their paces. It can involve writing code, or it can involve checking the correctness of programs or designs. It can be theoretical: reading several technical papers and explaining what you have learned. 513 students may do a project if they wish. This could be to improve your grade and/or in lieu of the final exam.

In more detail: there are many applications of logic to computer science. In the project, you will investigate some topic that interests you, in significantly more detail than I cover in class. If you have no idea what you might want to do your project on, a good start would be to read any or all of the Turing Award Lectures for the following Logic in CS awards. For the lectures, see `http://amturing.acm.org/lectures.cfm`.

- Leslie Lamport, 2013. Lamport invented the Temporal Logic of Actions (TLA).
- Ed Clarke, Allen Emerson and Joseph Sifakis, 2007 for inventing Model Checking.
- Amir Pnueli, 1996. Pnueli invented Temporal Logic.

Here's a very partial list of topics and/or tools that you might want to investigate:

- Datalog or Prolog
- Model Checkers
- SAT Solvers
- SMT solvers
- mace4/prover9
- Coq, Vampire, HOL, ...
- Alloy

If you investigage a tool, I would expect you to learn to use it and also to learn to some level, how it works. If you investigate a tool, it would be great if relatively early on, as part of the project, you give a 20 minute tutorial during class time explaining the use of the tool to the class.

I hope this sheet is enough for you to start thinking about topics that you would like to investigate. Talk to me by email or in my office hours about topics you are considering. For everyone who is going to do a project, I would like to have had discussed it a couple of times and have a plan, by the time of the midterm.

Is it possible to do a project with someone else? I can imagine some applied projects lending themselves to two people working together to build something. It would have to be obvious to me what each of your contributions is, and what the added advantage of working together is.