CIS 673 Fall 2012: Course Project

The goal of the class project is to gain hands-on experience with some tool for program analysis. Each student should do the project independently.

1. Choose a tool for your project. The list below contains suggested tools, but there are many other possibilities.

2. Read background material for the tool. This would typically include tutorial, papers describing theoretical foundations, and case studies.

3. Install the tool, and learn how to use it.

4. Design a case study for the application of the tool, and experiment to evaluate the tool. The evaluation can focus on the tool’s success to solve the analysis problem, the usability of the tool, and its scalability.

5. Submit a written report on your project (about 5 pages) by November 27. The report should contain a brief description of the tool, of your case study, and the experimental evaluation.

6. Prepare 20-min presentation for the class. Presentations will be scheduled for the weeks of Nov 26 and Dec 3.

Below are some possible tools for the projects.

1. SAT solver MiniSAT. Possible case study: modeling and solving a puzzle (e.g. Sudoku).

2. SMT solver Z3. Possible case study: solving an optimization problem (e.g. scheduling).

3. Model checker NuSMV. Possible case study: modeling and verification of a digital controller

4. Model checker SPIN. Possible case study: modeling and verification of a (finite-state) distributed algorithm.

5. Verification system PVS. Possible case study: modeling and verification of a program or a protocol.

6. Verification system Boogie. Possible case study: annotation and verification of a program.

7. Compiler infrastructure LLVM. Possible project: Compare and evaluate pointer-analysis algorithms.


If you have any questions about which tool to choose, and how to design the case study, send me an email to schedule a meeting. When you decide on the tool and the case study, send me an email describing what you plan to do.