

CPRE/SE/COMS 412, COMS 512 PROJECT PART 1

Optional for 412 students

As a reminder, for the project you will choose a (narrow) area in “Formal Methods in Software Engineering”, review the literature in your chosen area (perhaps not *completely*, but *thoroughly* and including the main papers), and write a report. For this part of the project, you should do the following.

1. Declare the area you wish to study.
2. Describe how this area fits in “Formal Methods in Software Engineering”, and in particular, how it relates to topics covered in class so far.
3. Identify several articles that you intend to include in your literature survey. I expect at least three articles, but the more articles you can discover now, the less work you will have later.
4. As always, your solution should be prepared as a \LaTeX document, satisfying the *other student viewpoint*, with a properly-formatted bibliography (for example, [1]).

Some potential areas are listed below.

- Symbolic model checking (using BDDs/MDDs)
- SAT/SMT-based model checking
- Model checking with theorem provers
- Modular / incremental model checking
- LTL vs CTL
- Stochastic logics
- Statistical methods for probabilistic model checking
- Markov decision processes
- Parameterized system verification
- Verification of multithreaded software
- Injection vulnerabilities by string analysis
- Program synthesis
- Concolic Testing
- Counterexample generation / analysis
- Counterexample guided Abstraction Refinement
- Choose your own area (you are encouraged to discuss this with the instructor)

References

- [1] Leslie Lamport. *\LaTeX : A Document Preparation System*. Addison-Wesley, second edition, 1994.