Topics in Automated Deduction – Final Project, due April 25, 2007

1. Either implement a new decision procedure that is not included in Harrison’s code or significantly improve one of the algorithms that is included.

Some suggestions include the following:

- A decision procedure for universal formulas in the theory of arrays [6].
- A decision procedure for ground formulas in a fragment of set theory [3].
- A decision procedure for universal formulas in the theory of inductive data types [1].
- Implement a decision procedure for universal formulas in real linear arithmetic using the algorithm Sh described in lecture 8. More information can be found in [2].
- Implement an improved propositional satisfiability algorithm which makes use of modern enhancements to DPLL, such as advanced decision and conflict diagnosis techniques. Some of these techniques are described in [5] and [4].
- Implement advanced first order resolution. See Harrison chapter 3 and references given there.
- Implement advanced techniques for Gröbner bases. See Harrison chapter 5.10 and the references given there.

You are welcome to try any of these or another idea of your own choosing. However, if you choose to do something else, please get my permission first. Also, feel free to ask me questions about any of these projects.

References


