

**California Institute of Technology**  
**Department of Computer Science**  
**Electronic Design Automation**

CS137b, Spring 2004

Spring Project

Monday, March 29

## Project

The center point for the Spring term will be a major, student chosen design automation project. The goal is to work through all phases of formulation, development, and analysis for a significant and original problem or an original attack on a conventional problem.

## Timeline

Select Project	Friday 4/2
Problem Formulation	Wednesday 4/7
Literature and Technique Review	Wednesday 4/14
Present Proposed Plan	class Monday 4/26 (+ 4/28?)
Present Preliminary Results	class Monday 5/10 (+ 5/12?)
Present Final Results	class Wednesday 5/24 (+ 5/26?)

## Description

- **Select Project** Start by picking a suitable project. I will be glad to find time to talk with you about this during the week. Preferably, you will have a task which naturally arises from your research which would make an excellent candidate for automation. We will need to talk about sizing the project appropriately for the quarter. I, of course, also have several ideas for potentially interesting projects to explore.
- **Problem Formulation** As we saw in the first term, problems which originally appeared complicated and full of many effects, can often be formulated cleanly and precisely as an optimization problem. Your goal will be to understand the essence of your problem and similarly strip it to its essence. This may include identifying why the problem becomes complicated, possible decompositions, and simplified problems which are part of the solution.
- **Literature and Technique Review** In almost any case there will be a number of problems which are (or seem to be) close to this one. Also, we identified many common techniques last term that can be applied to various problems. In this phase,

you should look up related work and make a thoughtful list of all possible ways to attack this problem. I will be glad to help you brainstorm about techniques and offer some starting point suggestions on papers to review or general themes to research. This phase should start almost immediately; the given date is simply the due date for completing this phase and writing it up.

- **Present Proposed Plan** In class, you will present your task, your formulation, a brief summary of techniques, and your proposal for attacking the problem. This means you should have finished analyzing the known options and have formulated either your adaptation of a technique or your synthesis of a new technique to solve this problem. Your plan should include details on how you intend to quantify and analyze your results and compare them to prior work.
- **Present Preliminary Results** In class, you will present initial results. By this time, you should have a complete version of your algorithm implemented and be able to generate some initial results. It is general my experience that unexpected effects and new questions arise during the development and initial experimentation process. The intent of this presentation is to identify additional experiments or improvements that are suggested by the initial results.
- **Final Presentation and Report** In class, you will present your final results. This presentation should be organized like a conference presentation on your new algorithm and results, including original motivation, formulation, technique description, and analysis. At this point, you will have had time to develop your implementation more completely, improve the implementation based on the feedback provided from the initial results, and perform additional experiments suggested by initial results.