ME/CS 132: Final Project

(Winter Quarter, 2009)

1   Final Project

Because of the nature of this course, it is difficult to give a conventional final exam. Instead, the final project should be considered as an extended homework where students can integrate the course concepts in a practical implementation.

Below are abbreviated descriptions of the projects that students may wish to tackle. Students can tackle a project individually, or in teams. The effort of the team should be commensurate with the team size.

Below are some suggestions for a final project. Students can propose their own projects, and need not be restricted by this list.

2   Final Project Suggestions

Depending upon their interests, students can choose projects that are either experimental, analytical, or algorithmic. Here are some suggested topics. Students can propose their own topic with my approval.

- Implement a sample based planner for a point-like or disc-like robot operating in planar polygonal environment.

- Implement a "D-star" algorithm on the ER1 (a sensor-based way to implement an approximate cellular decomposition) and negotiate at least 2 obstacles on the way to a goal.

- Develop a system to take a description of a closed polygonal room with polygonal obstacles in its interior and generate the voronoi graph. A more advanced version will also generate a path from an arbitrary initial to final goal.

- Develop a system to take a description of a closed polygonal room with polygonal obstacles in its interior and generate an exact cellular decomposition or an approximate cellular decomposition. A more advanced version will also generate a path from an arbitrary initial configuration to an arbitrary final goal.

3   Final Project Schedule

Prepoposal: All students taking the long project option must turn in a 1 page "prepro-posal" by Monday, Mar 9, 2009 (5:00 pm). This prepoposal will contain:

- A brief description of the proposed project.

- A summary of the likely approach that will be taken by the project investigator(s).

- A listing of the "project deliverables." That is, a description of how you propose to demonstrate and document the outcome of your project.

Due date: The final project is due at 5:00 p.m. on the last day of the winter quarter finals period. Your final project submission will consist of a project report that will include *at least* the following items:

- a short introduction that reviews the subject area of the project, the goals of the project

- a description of the technical approaches taken to solve the project problems.

- A demonstration of the project's function (e.g., snapshots of graphical simulations, or plots of data taken from the robot).

- A "debriefing," which is a brief summary of what you would do differently if you had more time, or started all over again.

Note that you can borrow material from your prepoposal to produce this final documenta-tion. In creating your final report, you should aim for a document that could be read and understood by another student in the ME/CS 132 class.