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## CSCE774 – Robotics

### Fall 2011 – Term Project

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A major component of this course is to complete a research project exploring, in greater depth, some aspect of planning in robotics. In very general terms, the expectations are:

- The project should be related to the **content of the course** in some meaningful way. An obvious choice would be to extend or refine one of the papers we'll read, but this is definitely not a requirement. For students already working on research, projects with strong connections to your existing research are encouraged.
- The project should explore a **new idea**, either by attacking a new problem or proposing a new solution to a previously-studied problem. It is *not* sufficient simply to implement one of the algorithms we study in class without any changes. Be creative!
- The project must exhibit good **scholarship**, citing related work and explaining how it is similar and how it differs.
- The project must include an **implementation** of some form. We will discover throughout the course that many important algorithmic problems in robotics are still interesting and challenging even when we idealize them. As a result, computer simulation will suffice for most projects. (For projects that require physical implementation, a few different robot platforms are available in my lab. Talk to me early if you are considering this kind of project.)
- The project must require **substantial effort** throughout the semester.

To evaluate your progress (and to ensure that it is truly a “term” project rather than a “last two weeks of the term” project), several intermediate submissions are required in addition to the final report. Details for each submission appear below, including rubrics that I will use as a guide for grading your projects. Note that the dates given below are the latest acceptable submission dates. Early submissions are welcome and every effort will be made to give timely feedback to all submissions, including anything submitted before the deadlines.

### Submission 1: Topic choice

Select a high-level topic. Submit via a one-sentence email.

**Due date:** Oct 14 @et 6

**Maximum score:** 1

Is the topic submitted on time?	
Does the topic relate to the content of the course in a meaningful way?	
<b>SCORE</b>	

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### Submission 2: Related work

Investigate existing research on your topic. Submit a report, approximately one page (not counting references cited), briefly describing this work and answering the question “What has already been done in this area?” Cite at least 6 published academic research papers. Use complete references, and format them in some suitable, standard way.

**Due date:** Oct 20 ~~Oct 18~~

**Maximum score:** 3

Does the report adequately summarize the current state of research in the topic area?	
Are there sufficient references?	
Are the references to published academic research?	
Are the references complete and appropriately formatted?	
<b>SCORE</b>	

### Submission 3: Progress report

Submit an early draft of your final report, at least two pages, demonstrating that you have made significant progress in organizing, developing, and implementing your ideas.

**Due date:** Nov 22

**Maximum score:** 10

Does the report clearly articulate a new problem or approach?	
Does the report clearly propose an approach to solving this problem?	
Does the report anticipate the technical challenges with the approach?	
Is there evidence of progress on the implementation?	
<b>SCORE</b>	

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### Submission 4: Project presentation

Give a very short presentation describing of your project to the class. Define your problem, describe your approach, and show your results.

**Date:** Presentations in class December 1.

**Maximum score:** 3

<b>CONTENT</b>	
Did the presenter give a clear statement of the problem to be solved?	
Did the presenter give a concise description of the approach?	
Did the presenter show the implementation and its degree of success?	
<b>FORM</b>	
Did the presentation make good use of the available time?	
Did the presentation stay within the time constraints?	
<b>SCORE</b>	

### Submission 6: Exit interview

Meet informally with the instructor after the submission of the final report. Bring a demonstration of your implementation if possible. Describe the ultimate outcomes of your project and answer the instructor's questions about your final report.

**Due date:** To be scheduled during the week of December 5-9.

**Maximum score:** 5

Was the student knowledgeable about all aspects of the project?	
Did the student respond to any technical concerns raised by the instructor?	
Did the student accurately evaluate the success of the project?	
<b>SCORE</b>	

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## Submission 5: Final report

**Due date:** Dec 5

**Maximum score:** 28

<b>PRESENTATION</b>	
Is the paper complete? Correct length and format?	
Is the writing style appropriate for an academic conference or workshop?	
Is the paper free from grammar problems and typos?	
Are appropriate, helpful figures included?	
<b>SCHOLARSHIP</b>	
Does the paper cite relevant related work?	
Does the paper explain its relationship to existing work?	
<b>PROBLEM STATEMENT</b>	
Does the paper state the algorithm's goals precisely?	
Does the paper make its assumptions clear?	
Are the assumptions reasonable?	
<b>ALGORITHM</b>	
Is the proposed algorithm stated clearly?	
Does the paper give sufficient motivation and explanation for the method?	
Are there sufficient details to understand and evaluate the method?	
<b>IMPLEMENTATION</b>	
Does the implementation exist?	
Is the implementation complete?	
Does the paper adequately illustrate the implementation?	
Does the implementation match the problem statement given?	
Is the implementation sufficient to evaluate the proposed method?	
Does the paper discuss the observed effectiveness of the proposed method?	
<b>GENERAL</b>	
Does the project relate well to the content of the course?	
Does the project explore a novel idea?	
Is there evidence of substantial effort throughout the semester?	
<b>SCORE</b>	