

Teaching Statement

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Teaching Philosophy. I believe that the purpose of teaching and education is to provide students with an in-depth understanding of the material being studied with the goal of preparing students not just to apply the material but to build upon it. Such an understanding will allow students to incorporate the material in their own work and enable them to do research in the area.

I design my lessons to teach the fundamental concepts behind the material being studied, and to demonstrate these concepts through real-world examples. As an example, I would teach an algorithms course by going through the most commonly used types of algorithms (divide and conquer, linear programming, etc.). I would provide a real world example for each type of algorithm and use these examples to demonstrate how to compute the complexity of that type of algorithm.

My teaching style combines traditional lecture based teaching with assignments and projects designed to reinforce the material. My assignments consist of a set of challenging problems that require students to apply the material to problems outside of those studied in class. These problems should be difficult enough to require students to think and reason about the material being studied. I also believe that it is important to teach experimentation and the scientific process whenever possible. To this end, I design projects which require students not just to implement code, but to experimentally evaluate and analyze the programs they create. As an example, I would incorporate into an algorithms course projects that require the student to implement some of the methods studied and experimentally validate their experimental bounds.

Teaching Interests. I am qualified to teach any undergraduate course as well as graduate courses in algorithms and complexity analysis. I am especially interested in teaching courses in robotics, computational geometry and algorithms. I would be particularly interested in teaching special topics courses in areas such as robotics or motion planning. In this course I would first go over some of the fundamental papers in the field (example: configuration space, PRMs and RRTs) then some of the most important and interesting recent work (example: Asymptotically Optimal Motion Planning).

Research Mentoring. As part of my research career I have had the opportunity to teach and mentor numerous undergraduate and junior graduate students. I provided these students with advice and assistance with their academics and research. I helped them to prepare for departmental milestones such as their qualifying exams, proposals and PhD reviews. I also helped many of our lab's students to prepare for their final exams and provided them with suggestions and feedback when writing their dissertations.

One of my most rewarding tasks has been to assist other students with their research. As part of this I help students to decide what projects to work on and to guide their progress with these projects. I provided these students with input and suggestions on what direction their projects should take and provided feedback on any ideas they had. In many cases these projects led to publications in conferences or journals.

As one of the senior students I am also heavily involved in teaching new students about the work our lab does. I help these students to learn the theoretical and algorithmic aspects of motion planning and teach them many of the basic motion planning algorithms. I am also responsible for managing and overseeing the development of our lab's motion planning code base (called *pmpl*), and introducing it to new students.

Professional Mentoring. I also serve as the senior programmer for the OSIS web based database project. In this role I managed and mentored a development team which at times consisted of as many as four programmers. My duties for this project include introducing new programmers to our development infrastructure and helping them to learn our code base. I am also responsible for teaching new users programming languages such as php and mysql that they will use while working on this project.