

TEACHING STATEMENT

ROGER MAILLER

I take my role as an educator very seriously. My general philosophy is to make learning enjoyable, yet rigorous. I'm a strong believer that courses should teach practical skills that are backed by a strong theoretical foundation. Many of my students enjoy my teaching style and feel challenged by the projects, homework, and exams I give. I often receive feedback that my courses are demanding, but they make students feel more confident in their ability to be successful and continuously adapt to change.

In my nine years at TU, I have taught a total of 37 classes (1-1 for the first four semesters, 2-2) and have received student ratings that are above department and college averages for each one. Along the way, I've introduced 6 new courses to the department with three of them being cross-listed as undergraduate/graduate and two of them being cross-listed between computer science and biology. They are:

- **Introduction to Game Programming (UG):** This course teaches students how to develop 2D and 3D computer games. It emphasizes proper design, the use of threads, user input, graphical user interfaces, and computer audio.
- **Computer Gaming in Early Education (UG):** Students that take this course work directly with elementary school student in Tulsa Title I schools to teach them the basics of software development. Using a mixed lecture/practicum approach, students gain firsthand experience working with children from diverse backgrounds to design and build a working computer game.
- **Game Engine Design (UG/G):** Students learn to develop a commercial grade 3D game engine by exploring the design of an existing engine. Along the way, they learn about rendering, memory management, math libraries, physics engines, and user input control.
- **Computational Neuroscience (UG/G):** This cross-listed computer science and biology course explores the function of nervous systems from the sub-cellular up to networks of neurons. Various mathematical and computational models are explained and analyzed throughout the course.
- **Advanced Computational Neuroscience (UG/G):** This course picks up where computational neuroscience leaves off. It focuses on more advanced models of neuron function and modeling with an emphasis on current literature. Students are required to propose, develop, and present a computational neuroscience related research project.

- **Image Processing (G):** The course explores algorithms and techniques for converting images into quantifiable information. This is a research project oriented course where students propose a project, study relevant research literature, attempt a novel approach for their project, and present their results in both a written and oral format.

Given my research interests, several of these courses may appear to be an odd fit for me to teach. I began teaching game programming to train students to develop sophisticated simulations for both my distributed problem solving and computational neuroscience research. Although their purposes are different, the construction of a simulator and a game are very similar. From there, the gaming courses took on a life of their own and what started as a way to recruit and train student for my lab has expanded into an entire major with two separate tracks.

I started teaching image processing for a similar reason. Much of the biology work that my lab does with *C. elegans* involves processing video data. In order to learn image analysis techniques, I decided to teach a course on the subject. Again, the course was well attended and has been a valuable addition to the graduate courses offered at TU, so I continue to teach it.

In addition to these course, I am more than comfortable teaching courses in AI, machine learning, constraint reasoning, data structures, and introductory programming. However, I am very flexible and enjoy teaching new topics when the need arises.