

Teaching Statement

Obtaining hands-on experience with building real computer systems allows students to gain an understanding of design challenges faced by engineers in the industry, better preparing students for their future careers. I am developing and teaching classes that are hands-on and expose embedded computing systems to high school students, undergraduates and graduate students. In the following paragraphs, I will present my teaching contributions in more detail.

Graduate Teaching Assistantship

I was a teaching assistant for Prof. Dean Tullsen's Computer Architecture lab, CSE 141L, in the quarter of Winter 2009. The class consisted of four different projects where each project builds on top of the previous one with the goal of successfully implementing a fully functional processor by the fourth project. I was solely responsible for holding office hours for approximately 40 students where I gave further explanation of the material taught in class, and helped the students with their projects. I also guest taught two lectures. My overall TA evaluation score for the class was 4.482 out of 5.0. Sample comments from my evaluation results include: "*Great TA; Helpful and knowledgeable; Very helpful; Always answered questions promptly and explained his grading very clearly; It was clear that he was there to help us learn and get through the course; Responded quickly to email and web board; Highly accessible even outside office hours; I greatly appreciate his time/effort put into course.*"

California State Summer School for Mathematics and Science (COSMOS)

COSMOS is a 4-week residential summer program designed for talented and motivated high school students. The embedded systems 'cluster' teaches around 20-25 students concepts in computer science and engineering and provides an introduction to computation. I was involved with COSMOS in the summer of 2010. I was the lead in introducing a new material for the COSMOS program that involves programming and developing the intelligence for a simple robot called Scribbler to perform tasks like finding objects and avoiding obstacles. Scribbler provided a unique way to present aspects of computational thinking to students at an early age, while creating excitement for computer science and engineering. Due to its success, we will continue using Scribbler robots, and *I will serve as an instructor for COSMOS 2011*. I am also a mentor for a COSMOS student group, Sahil Sangani and Mark Matten – both COSMOS 2010 Alums. This group received the Intel Independent Research Grant in 2010 and I am currently mentoring them on their science fair research project. Additional information about the COSMOS program can be found at <http://www.jacobsschool.ucsd.edu/cosmos/>.

Course Development

Based upon our success with the Scribbler robot in the COSMOS program, we developed a new freshman seminar, CSE87: Introduction to Robotics, centered on the use of the Scribbler robots. Our students complete different projects throughout the quarter including *drawing, maze-solving and object finding* to learn how different sensors and actuators function and how sensors and actuators can be used to perform various tasks. This class is completely hands-on, providing an accurate view of what college students majoring in computer science, computer engineering or electrical engineering can do with these degrees. Unfortunately, the normal view of computing is sitting in front of a desktop programming, which is no longer the case for many college students graduating in these fields. We offered this seminar in Fall 2010, and are also offering it in Winter 2011. Both offerings were so successful that we opened a second section. We plan to continue to offer this freshman seminar to students every quarter. Additional information about our class can be found at <http://cseweb.ucsd.edu/~kastner/teaching/cse87/>.

I had the privilege to guest lecture some of Prof. Ryan Kastner's classes such as CSE 30: Computer Organization and Systems Programming. *I will be teaching CSE 30 in summer 2011*. This class will have substantial hands-on experience where students program embedded systems using the Cypress Semiconductor Programmable System on Chip boards. Students will complete several labs, building projects that utilize a variety of sensors.

Undergraduate and Graduate Research Mentoring

I have mentored many students from Prof. Ryan Kastner's project-based classes, CSE 145: Embedded System Design Project and CSE 237D: Embedded System Design, over the last two years. I recruit students from these classes to perform research with our lab. I have an outstanding track record of involving undergraduates in research. Two undergraduate students, Sam Wood and Alex Indaco, have already played a substantial role in the research and engineering aspects of Biomedical Imaging projects. Sam and Alex have successfully joined graduate schools, UCSC and SJSU respectively. Other undergraduate students, Jeffrey Su and Isaac Phillips, are currently working with us to develop our high-level synthesis tool, Simulate & Eliminate. Furthermore, I currently co-advise 3 Ph.D., 2 masters and 3 undergraduate students.

Promoting Diversity by Mentorship

I value the importance of promoting diversity in Computer Science and contribute to it through mentorship. Women in computer science are considered to be a minority, constituting only 20% of the department's enrollment. I served as a Peer Advocate for an incoming graduate student, Catherine Wah, through the "Graduates United in the Interests of Diversity and Excellence (GUIDE)" program at UCSD. Our freshman seminar, CSE87: Introduction to Robotics, hosts a relatively large number of female students, 15 out of 40, from various departments including mathematics, economics, biology and music.