TEACHING STATEMENT

SERGE EGELMAN

Topics

My specific research interests fall under "usable security," which is an interdisciplinary area combining information security, cryptography, software engineering, and human-computer interaction. Below are a few examples of courses I would like to teach. All of these courses would include semester-long projects and emphasize class discussions.

Usable privacy and security: My advisor, Lorrie Cranor, teaches a popular course on our research area which I would like to adapt. Students are introduced to research in the area and study some common pitfalls of good usability and how they result in security problems.

Information security: I have served as a TA for several information security classes and strongly believe a firm grasp of these concepts is essential for all computer science students. I would enjoy teaching this class to both undergraduate and graduate students. I envision such a course covering cryptography, vulnerabilities and exploits, and network security.

Human-computer interaction: I would be comfortable teaching an introductory HCI course for undergraduate students. I envision this course covering basic HCI concepts, user studies, and experimental design.

Computers and society: This would be a course for both computer science majors and non-majors where we examine public policy aspects of computer science. Topics might include intellectual property, online privacy, spam, and malware.

Teaching Philosophy

My teaching philosophy comes from my own experiences: classes that interested me most—and that I most enjoyed—were ones where the professor applied the material to the outside world. Discussing real world applications is a great way of engaging students who are not traditionally interested in computer science. I have given several guest lectures in classes on computers and society, engineering and public policy, and information security, and like to start by citing a relevant news article. For instance, in a lecture on spam, I might start out by mentioning a recent prosecution, which would lead into a discussion on related public policy issues, how spammers operate, how current spam filters work, and how spammers can be identified and caught.

In the classroom I prefer a loosely-structured discussion format rather than simply lecturing at the students. Students should be encouraged to ask questions and engage in discussion, but slides should be used to guide the class. In fact, a technique that my advisor uses that I hope to incorporate is debating. In preparation for class, students are assigned readings and a position. After both sides present their positions, they answer questions from other students and the professor. This encourages students to prepare for class as well as to engage in critical thinking.

Finally, I believe that class projects are an important tool for keeping students interested in the material as well as for applying what they learn to the real world. In addition to providing useful knowledge, topics discussed during lecture should provide the students with insights that will aid them in completing their projects. I have mentored many students working on class projects because those projects were relevant to my research. This provided students with exposure to current research in the area and in many cases resulted in publications. It is fundamentally important to tie research into the curriculum so that more students consider pursuing higher levels of education.

Experiences Teaching and Mentoring

As both an undergraduate and graduate student I have had the privilege of teaching and mentoring other students. As an undergraduate at the University of Virginia, I served as a TA for five semesters. I was initially responsible for holding office hours and grading assignments, but over time my responsibilities increased to creating homework and exam questions and sometimes even lecturing. Along with my responsibilities, the level of the classes also increased. During my last semester as an undergraduate I served as a TA for a graduate-level information security course.

During graduate school at Carnegie Mellon, I served as a TA for my advisor's Computers and Society class as well as Norman Sadeh's Information Security class. While I had standard TA responsibilities for both classes—office hours and grading—I thoroughly enjoyed giving guest lectures, creating assignments and exams, and mentoring students who were working on semester-long projects. I have also had the honor of giving guest lectures in other classes on topics such as spam, online fraud, my research on privacy indicators and security warnings, and even public policy issues surrounding computer security.

Because my advisor frequently discusses my research in her courses, several of her students have chosen related class projects. I advised many of them on their projects as a mentor, often working very closely with them. Several of these projects have developed into publications, ongoing collaborations, and even friendship. To give an example, I am currently working with a first-year PhD student and two master's students on a laboratory study of SSL warning messages that we hope to publish. I have been guiding them through the process of designing the experiment, collecting data from human subjects, and analyzing the results. While I have tried to teach them the mistakes I have learned from over the years, I have found that it is equally rewarding to see them learn from our new mistakes.