Teaching Statement—Constantin Serban

Teaching philosophy

One of the valuable and enjoyable experiences I had as a graduate student was to teach and interact with the students in my class. An interactive and dynamic class helps motivate and engage students in the studying process. I consider teaching to be a beneficial experience for the teacher as well. Teaching encourages me to prepare the material in a systematic way, thus providing new insights into the topic. Additionally, the discussions in the classroom often give rise to new research ideas. Teaching system classes in Computer Science provided me with the opportunity to emphasize the practical aspects of the material and to apply it to real-life projects. I observed that such a hands-on approach, doubled by a solid theoretical foundation, helps students relate better to the material and increases their interest in the course.

I find important that my classes present a balanced curriculum and cover both traditional concepts and the latest advances in the field. I consider that the students should be exposed not only to well-established material, as found in textbooks, but also to more novel material published in recent research papers. The presentations of papers and the following discussions help students develop a critical thinking and provide an exciting way to start getting involved in research.

Teaching does not take place only in the classroom. I found that after class informal discussions and office hours are important parts of the learning process. I believe it is important to encourage students to use discussion groups, as a mean to supplement the interactions and the dynamics of a class. Nursing undergraduate teams to chose research-oriented projects also helps the students to get an in-depth understanding of the topic and encourages them to follow a research career.

As a senior graduate student working in the Security and E-Commerce (SEC) laboratory, I had the opportunity to mentor my junior graduate and undergraduate colleagues. This helped me get an understanding of both the benefits and the duties of an academic advisor. I consider important to encourage students to start the research early in their graduate studies, to provide full implementations of the proposed concepts, and to analyze critically their own work and the work of other researchers.

Teaching experience

I have an extensive teaching experience as both teaching assistant and lecturer for undergraduate and graduate system classes. I gained much of my teaching experience early in my graduate career as a TA for Operating System Design class (senior undergraduate, six semesters). In this class I was responsible for recitations and occasional lectures, grading, and project preparation. The operating system class presented me with an opportunity to combine the teaching of theoretical concepts with
the development of assignments consisting of hands-on projects implementing parts of the operating system. Among these projects, I designed a Remote File System, a Virtual Memory Management Unit, and a File System With Disk Emulator. These assignments encouraged students to understand various OS concepts in depth, exercise their C language skills, follow formal specifications, and increase their creative thinking through research-oriented projects. Some of the projects that I designed can be found at http://www.research.rutgers.edu/~serban/teaching/.

As an instructor for Computer Network Applications (undergraduate MSIS/Rutgers, one semester), and TA for Internet Technologies (senior undergraduate, two semesters) I taught three-hour long lectures. For these classes I designed assignments requiring both the development and the usage of a number of Internet and web tools, such as an UDP chat server, an HTTP proxy, and a number of dynamic web sites. The students later enhanced these projects to deploy them outside Rutgers, as real-world applications.

The TA-ship for Security in E-Commerce Systems (graduate, one semester) turned out to be one of the most rewarding teaching experiences I ever had. This course gave me the chance to present and debate my own research in front of my fellow graduate student colleagues, and to get involved in advising and counseling a number of teams in their research-oriented projects.

**Teaching interests**

Given my research interests, I would especially like to teach a course in Security for Distributed Systems, both at undergraduate and graduate levels. Such a course would cover low-level cryptography, network security, and application-level security, with emphasis on applied security solutions. As part of this course I would like to incorporate regular discussions of research papers reflecting advanced topics in enterprise-wide security.

I would also like to teach a Software Engineering course—both graduate and undergraduate level. In such a course I would cover various issues related to the development and maintenance of large software systems: life cycle, definition and enforcement of architectural models, Object-Oriented Programming, Aspect-Oriented Software Development, maintenance, testing and software evolution. This course would provide basic understanding of the concepts, and would also cover recent research papers in these areas.

I believe that teaching an introductory course in computer science is a very rewarding experience, allowing the opportunity to inspire and mentor junior students. Based on my experience, I can teach general, junior-level, computer science classes. In addition, based on my teaching experience and systems background, I can also teach more specialized courses in Computer Networks, Operating System Design, and Distributed Systems, at both graduate and undergraduate level.