

TEACHING STATEMENT

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My first experience of teaching in a formal setting was during my early undergraduate years. I taught, prepared laboratory sessions and gave tutorials at a number of 2-3 day workshops organized by IIT Bombay on Unix, Java and the Internet. This was a challenging experience for me as it involved keeping a 300-member audience, who had varying levels of familiarity with the subject matter, interested and engrossed. In my senior year, I taught a course on Networking along with Prof. A. Karandikar from IIT Bombay, at an affiliate institute of the Center for the Development of Computing (CDAC) in Bombay. I took up this task enthusiastically and taught around 18 hrs of lectures, set homeworks and gave exams for the course.

During my graduate years, I gave a number of talks at Stanford, in academic conferences and to Industry. On one occasion, I gave a full day tutorial on “Software Design Ideas in Packet Classification” to a group of engineers. I have learnt slowly (and am still doing so!) the subtle differences regarding teaching to students, presenting an idea to colleagues at a conference, or giving a talk to Industry. Realizing that I have a long-term interest in teaching, I took a public speaking class at Stanford. In this class, our lectures and talks were taped and constructive criticisms were offered by both instructors and students. Thus, I experienced how one can be both a teacher and a student simultaneously.

At Stanford, I was a Teaching Assistant on three different occasions, for an advanced graduate level two part course, “Packet Switching Architectures”. There are two reasons why I enjoyed this assignment. First, this course was a novel attempt in teaching the mathematical methods used in the analysis of packet switching. I got the opportunity of contributing to and developing the course content, homeworks, exams and programming assignments. I was able to appreciate the benefits of the course curriculum partly because I was reminded of my own (sometimes frustrating!) efforts in trying to understand packet switching as an incoming graduate student, in the absence of a formal course in the area. Second, the course contents overlapped with many topics in my immediate area of research. Thus, in the second part of the course, on occasion, I prepared and gave lectures on topics of research that I had worked on. Also I suggested interesting research topics for projects, and participated and advised students. I also was able to see first hand how teaching and research can be complimentary. As an example, one of the projects confirmed via simulation our analysis of a packet buffer memory hierarchy that eliminates cache misses, which was the topic of a research paper that we recently submitted to IEEE/ACM Transactions on Networking.

I can teach a broad set of courses, in the area of Algorithms, Automata, Computer Architecture, Databases, Programming Languages, Networking and Probability at the undergraduate level. At the graduate level, I can teach a number of standard networking courses such as Multimedia Networking, Network Programming, Mobile and Wireless Networking, Distributed Systems and advanced topics in related areas. In addition, I intend to introduce the following new advanced graduate level classes.

- **Packet Switching Architectures:** I shall build upon prior experience that I have gained at Stanford. I intend to further develop this course by focusing on the impact that recent advances in chip fabrication, optics and serial link technology have on switch design.
- **Network Architecture:** I intend to carefully develop this course, which would expose students to the fundamental principles used to design and architect networking systems. This course will expose students to mathematical techniques borrowed from a number of areas in Algorithms, Computer Architecture, Combinatorics, Probability & Queueing Theory. However, this course will differ from a number of previously offered courses, by focusing on networking systems which offer performance guarantees. In the coming years, this course will also expose students to issues such as fault tolerance, reliability, uptime and simplicity of design, which will become increasingly important.

I believe that universities have an important social responsibility of training and mentoring students to have “open minds” and to think rationally. Though I have not directly mentored students for long periods of time, my interactions with junior colleagues and students, and my personal positive experiences on being mentored, lead me to believe that I am qualified to do so. Teaching and mentoring gives me the opportunity to understand, learn and mold young minds to the larger cause — the betterment of both science and humankind; a cause that I passionately believe in. In a nutshell, that sums up my main motivation for pursuing an academic position.