Teaching and Mentoring Statement - Sanjay Rao

I am interested in teaching systems courses, particularly related to networking, at both an undergraduate and a graduate level. I look forward to teaching as a great opportunity to broaden my horizons given that research activities tend to have a narrow focus. In addition to classroom teaching, I look forward to mentoring, and the opportunity to mould students with raw talent into full-fledged researchers. My related experience at Carnegie Mellon has included serving as a teaching assistant, preparing guest lectures and mentoring junior students. The experience has been enjoyable and has given me the necessary preparation for these tasks.

I served as a teaching assistant for a sophomore course on *Introduction to Computer Systems,* where my responsibilities included teaching weekly recitations, and designing and completely managing a course project. Through this experience, I learnt that teaching involves considerable creativity, and well thought out and innovative laboratory assignments can make traditionally tedious topics fun and enjoyable for the students. An excellent example was a course project where students learnt to use debuggers and understand assembly code in the process of discovering a magic pass-phrase that could help defuse a "binary bomb".

I have served as a teaching assistant for an upper level course on *Databases,* where my responsibilities included designing and grading homework assignments, and helping students with a large-scale course project. While my prior exposure to databases was fairly limited, I found that with extra effort, I was not only able to do a competent job, but benefited by getting exposed to a different field. This experience has convinced me that one of the joys of teaching is learning, and the best way to learn is to teach.

I recently delivered a guest lecture on multicast in an undergraduate networking course this year. My lecture discussed the trade-offs between fundamental architectural choices for multicast, replacing a more traditional lecture on protocol details with the IP Multicast architecture. The experience has highlighted the opportunity that researchers have to actively impact and shape textbooks and standard teaching curriculum. At the same time, the opportunity comes with the responsibility that multiple points of view are presented in a balanced manner.

My most extensive mentoring experience has been working with Aditya Ganjam, who did his Masters Thesis on End System Multicast, and is now part of the Ph.D program at Carnegie Mellon. I cherish the experience and derive a lot of satisfaction in having played a role in his rapid evolution into a strong networking researcher. In addition, I have significantly influenced the thesis work of Annie Cheng and Frank Chan, INI Masters students, and have played the role of a senior student consultant with Ashwin Bharambe (Ph.D student) in his early work on Mercury.

My experience has led me to think about several issues related to mentoring. First, I would seek to make a student feel a full-fledged and proud owner of the ideas he is investigating, and as much a part of the big picture as possible. Second, while I would actively motivate and steer students towards research directions that are fruitful in my judgement, I would be wary of micro-managing and appear interfering. Finally, I would like to foster collaborative relationships among my students, and encourage them to take on larger challenges through more cohesive efforts.