Ranjan Pal

Statement of Contributions to Diversity

My experiences with contributing to diversity have come from both the teaching front as well as the research front. In this statement, I cite my most relevant experiences and future plans with respect to reaching out to a broad and varied academic audience.

I served as a teaching assistant (TA) for the core graduate "Analysis of Algorithms" class at the University of Southern California for multiple semesters. This course was attended by students from various departments including computer science, electrical engineering, biological sciences, and mathematics. The biggest challenge for me was to make a hard subject like algorithms interesting and manageable for students from diverse backgrounds. Apart from my usual office hour duties to clear student doubts, I had to take some innovative steps to make sure that most students in the class got a good feel and intuition about algorithmic problem solving. *First*, I held weekly recitation sessions that were divided into two halves: the first half was dedicated to clearing concepts taught during lectures, and the second half dealt with solving a wide spectrum of problems (easy to hard), most of which I designed myself. During the first half, I typically made it a point to ensure that students from the biological sciences and the electrical engineering backgrounds get relatively more attention to their queries compared to those from computer science and mathematics majors. In the second half, I kept the problem solving sections collaborative, and interactive to enable students grasp solution intuitions better and faster. I observed that students from all majors were are able to think more clearly in interactive settings when compared to non-interactive settings. *Second*, I administered the formation of study groups for problem sets. The study groups were formed so that each group had a good mix of students from multiple backgrounds to brainstorm problems together. This 'group formation' concept was an instant hit. As a result, I observed that most students learned the basic concepts well and it got reflected in their exam scores. *Finally*, I was always available to students via email (even at odd hours) to clear important subject doubts. I got very good TA feedback, specifically for this 'study group' concept. *For my efforts as a TA, I received the accolade of being one of the top five TAs in the Viterbi School of Engineering for the year 2012-2013.*

As part of future plans, I am particularly excited to start and teach a new graduate class on economics of security, which will give students from varied disciplines, an interdisciplinary perspective to improving cyber-security. It is common knowledge amongst the security community that technical solutions, though important, are not enough to ensure a robust state of security. Currently, computer science students only learn the technical concepts behind computer security in potentially a single class. Probably only a few of those students take courses in either of economics, game theory, or public policy. Even if they do, the classes are often disconnected from each other, are unlikely to cover security applications, and more importantly do not provide a holistic view to improving cyber-security. Similarly, students from other disciplines learn aspects of security mainly from a qualitative and/or experimental viewpoint of their own discipline, but fail to model and prove their hypothesis/conjectures mathematically. Through a new course, I plan to (i) educate students on ways to improve cyber-security by adopting concepts from multiple disciplines, (ii) bridge the qualitative-quantitative gap between students of varied majors, and (iii) help students think more rationally on global security issues. Finally, I realize that it is very important to disseminate to the research community and general audience, new advances in security research, that might have a positive impact on existing and future state of cyber-security. In this regard, I plan to give talks at various conferences and seminars, present tutorials at different venues, and speak about my research in other schools.