

Teaching Statement

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I am excited about the prospect of becoming a faculty. First, I simply enjoy student interaction. Explaining concepts and communicating ideas is one of the greatest challenges for me as a researcher and teacher. To watch students learn and make progress, to see them understand methods and spark their interest, is also one of the most enjoyable activities. Second, I like working with undergraduate and graduate students across departments and disciplines. Their diverse perspectives inspires and motivates myself to adopt different techniques and viewpoints to my own field. In my opinion this is one of the keys to explore the true breadth and scope that the field of computer science encompasses.

Background

I have been interested for a long time in educational issues and I see my role as a future professor not only in teaching the class material, but also to enhance the overall educational experience for students. While studying computer science at the University of Darmstadt, Germany, I enrolled in Pedagogic (Philosophy of Education) as a minor. As a research assistant at the Institute for Professional Education, University of Darmstadt, Germany, I participated in an interdisciplinary study of highschool students in Germany lead by A. Paul-Kohlhoff. As part of this project, we developed and carried out teaching units to reflect on different career options, especially in science and engineering. The main goal of this study has been to promote and show high-school student the variety of options that the field of science and engineering encompasses (see [Pie96]).

As a graduate student at Carnegie Mellon, I was actively seeking different opportunities to refine my teaching abilities and reflect on teaching in general. Starting in 2000, I voluntarily participated in the “Future faculty program” to document teaching development offered by the Eberly Center for Teaching Excellence at Carnegie Mellon University and attended several seminars on course design, teaching assessment and understanding student audiences. After the observation of a class I taught in the graduate course on Computation and Deduction, I was invited to join the Eberly Center for Teaching Excellence as a Teaching Fellow in 2001¹. The role of the teaching fellows is to co-teach seminars offered by the Eberly Center, conduct class room observations and be a contact and resource for other graduate student. Being a teaching fellow gave me many opportunities to work with other students across departments and disciplines.

In addition, I was actively involved in the organization Women@scs (faculty advisor: Lenore Blum) of which I am a founding member. One of the primary goals of this organization is to promote and enhance the educational experience of undergraduate and graduate women in the School of Computer Science. Under Lenore Blum’s leadership, I have for example participated in a panel on “Women in Computer Science: The Carnegie Mellon Experience” at the Grace Hopper Celebration, 2000, where we presented and discussed some of our efforts. I also assisted in a grant proposal on narrowing the gender gap and extending the IT pipeline to the graduate level.

¹A note about the classroom observation is attached.

Teaching Experience

I have several semesters of teaching experience assisting in undergraduate and graduate courses at the Technical University Darmstadt, Germany, and at Carnegie Mellon University, USA. My responsibilities included weekly recitations, designing homework assignments and grading as well as guest lectures. At the Technical University Darmstadt, I have been a teaching assistant for the undergraduate course on “Data-Structures and Algorithms”, where I gave weekly recitations and graded homework. I also was an instructor on an interdisciplinary team for a new internet introductory workshop “Impact of the WWW - A course with practical experiments” which targeted women and minorities as an audience.

At Carnegie Mellon University, I had the opportunity to assist in teaching in different courses. I was a teaching assistant for the undergraduate “Programming Language” course, taught by Stephen Brookes. This course introduces juniors and seniors to the fundamental principles of programming languages. In Spring 2001, I signed up as a teaching assistant for the interdisciplinary course on “Constructive Logic”, a course offered to Philosophy, Computer Science and Mathematics undergraduates. What distinguishes this course from other logic courses, is that it aimed not only at explaining the basic concepts in logic, but also to teach students how these concepts evolved, what decisions were involved and how logic influenced computer science in practice. As a tool, the students used the Tutch proof system, developed at Carnegie Mellon by Andreas Abel (Technical University Munich) and Frank Pfenning, to type in proofs and programs. This allowed not only to deepen concepts taught in the course, such as the close connection between proofs and programs, but also gave students instant feedback when they were doing their homework.

Finally, I chose to assist my advisor Frank Pfenning in teaching the graduate course “Computation and Deduction”. This course is an elective graduate course which introduces students to research in programming languages, theory of computation and logical frameworks. I helped in designing homework assignments, grading homework and gave two guest lectures in this class. Although teaching a graduate class is not required for computer science PhD students, I volunteered to teach this class for mainly two reasons²: First, it gives me the opportunity to observe an excellent teacher and second, I gain a deeper understanding of the area and it prepares me to teach a similar class myself.

I am looking forward to teaching my own class and advise students. I feel confident teaching any introductory computer science course as well as more advanced courses such as programming languages, formal methods or logic. As graduate courses I would like to teach courses such as computation and deduction, programming languages, software verification and theorem proving.

References

- [Pie96] Brigitte Pientka. Ist die Informatik männlich? Eindrücke, Erfahrungen, Forderungen. In A. Paul-Kohlhoff and C. Walter, editors, “*Eine Frau, die Maschinenbau studiert ist kein Wesen vom Mars . . .*” – *Studentinnen motivieren Schülerinnen*, volume 17. Darmstädter Beiträge zur Berufspädagogik, 1996.

²In the computer science department, PhD students can choose to be a teaching assistant for a graduate class, instead of taking a class. This is called Fahlman Unit — named after Scott Fahlman who suggested this idea.