

# Statement of Teaching

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Teaching assignments beyond seminars and lab sessions are rare for doctoral students in the German university system. Despite this, I have been fortunate to have the chance to gather such experience, which has proven both rewarding and motivating for my overall work. I have also had the opportunity to advise and mentor students at various levels, leading to interesting research and rewarding feedback. From these experiences, and from the lessons afforded me by my advisors, I envision teaching and mentoring as an integral part of my future career profile.

## Teaching Philosophy

I believe that committed interaction between students and an instructor is paramount to making teaching a successful endeavor for both parties. The antiquated image of instructors as monologists and students as passive and unengaged assemblages cannot function in the fields of engineering and computer science. Instead, a dynamic approach is needed where instructors are receptive and adaptable to students' changing needs and where students take an active role in their education by contributing to discussions and by participating in hands-on projects related to the lectures. This approach poses interesting challenges when applied to large undergraduate lectures, but I think it is essential to promote this kind of interaction and mode of learning since this phase in the education of young students is likely to form the mindset for their future career paths. Additionally, an interactive scenario provides the chance to become acquainted with the goals and motivations of the attending students, thereby allowing the early identification of young talent interested in research in order to aid in fostering their academic drive.

One way to achieve these goals is to encourage critical thinking with the help of term paper assignments and a large amount of practical work in lab sessions. From my experience, this approach is well received by students since it is seen as more interesting and allows them to synthesize abstract material learned in class into concrete ideas and projects. At the same time, it encourages interaction between students (e.g. in the case of group assignments or large project assignments requiring cooperation between students) and also allows a better and more precise assessment of the students' achievements.

An important point for me in teaching is also the use of new media, especially electronic lecture presentations and animations, which, in my opinion, has many positive effects. It ensures that the lecture notes are always readable, consistency across lectures is easier to maintain, and notes can be made available shortly after or even before the lecture. In addition, the use of animations helps to make complicated issues much more visible and facilitates understanding. I have been doing this in my current teaching (as well as in academic talks) wherever possible and it has proven to be a very efficient method.

It is clear that all of the suggestions above lead to an increased effort on the part of the instructor for the preparation of the course. It is my conviction, though, that this extra effort will pay off in the form of highly motivated students who are competent critical thinkers able to implement their own ideas in a scientific manner. This will result in an interesting and mentally rewarding experience for both parties.

## Teaching Experience

Currently, my teaching focuses on the course "Computer Architecture and Networks", which has been designed for the newly created master's program "Computational Science and Engineering" at the Technische Universität München.

This class, for which I am solely responsible, is intended for non-computer science majors (mechanical, civil, and electrical engineers) and is being held this semester for the first time, requiring that it be developed from scratch with no major templates available. Fifteen registered students are taught in English (the whole master's program is in English) and in a distinctly American setting, meaning that they are expected to submit term papers and take exams in order to receive direct credit for the course. Here, I am implementing the goals set forth above for effective teaching with positive results so far and despite the extensive effort necessary to prepare this course, it is a rewarding experience that encourages me to pursue this career path further.

My initial teaching experience, however, started much earlier. As an undergraduate, I served as a grader in the Mathematics department. Then, during my entire graduate studies at the chair for Computer Organization and Technology, I was involved in the "TGI Praktikum", a practical course for first and second year students dealing with aspects of technical computer science ranging from transistors and VHDL design to microprogramming and assembly language. During this time, and with the input of all scientists in our chair, this practical was revamped from a pure lab session format to a group work format. Student groups of three are given tasks in various areas which they solve on their own with the support of the scientists on the chair in an advising and project management role. In this format, it is our responsibility to ensure that the student groups meet the requirements of the tasks set before them and produce satisfactory deliverables, which includes a project summary talk.

I have also been involved in numerous seminars on various topics (for a complete list, please refer to my CV) and in a course on simulation where I was partially responsible for the lectures and in charge of a practical session.

In addition to this university experience, I was also involved in two tutorials for SCI (Scalable Coherent Interface) technology which included both presentations and practical work for the participants. These tutorials were held in the context of the SCI Summer School, an annual event intended to give newcomers to SCI a good start into this clustering technology and to provide researchers with additional knowledge beyond their own area of expertise. These tutorials allowed me another view into the role of teaching, which I consider very important.

## **Advising Role**

During my graduate studies I was fortunate to have several excellent advisors (in chronological order: Dr. A. Chien, now UCSD, Prof. Dr. H. Hellwagner, now University of Klagenfurt, and Prof. Dr. A. Bode, my current advisor). Because of my transcontinental education, I have experienced both the American and the German view on advising and can draw from positive aspects of both systems.

I have also had the opportunity to gather some experience in advising others. Within the SMiLE project, where I have been mainly involved over the years, we have had many undergraduate and master's level theses which I actively supervised. In this advisory role, I dealt with both good students and problematic ones. While the former is certainly more enjoyable and productive, the latter cases provided valuable lessons for future use.

In summary, I enjoy these advising roles. They allow me to progress my own research by directing topics towards common research interests while at the same time aiding in the advancement of others. For the latter, it is very satisfying to see positive effects of my work and my previous experiences on a younger group of scientists. To achieve this, I think it is necessary to find the right combination of collegiality with a clearly defined leading role.