

Teaching Statement

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Teaching Profile

Approach. As a teacher, my goal is not only to provide students with a foundation for understanding particular topics, but to help them become independent and motivated in what they do. I believe that knowledge is best strengthened with hands-on experience that builds on the course material, and this is particularly true in systems. Bachelor's students are often still unsure about their paths and are struggling with skills such as time-management or prioritization of tasks, so I try to highlight to them parts of the curriculum that are particularly important but avoid "hand holding". In contrast, Master's students have a clearer idea of their direction and teaching is often more about providing a "skeleton" of knowledge that they extend with self-study, based on their own interests and goals. I also encourage group discussions and some form of peer-review.

Experience. My practical experience comes from ETH Zürich where I have been a teaching assistant (TA) for more than 5 years, both for Bachelor's and Master's level courses. These covered the areas of Databases, Introduction to Programming, and Distributed Systems. As a teaching assistant my tasks included: preparing and leading exercise sessions and practical work, advising students on projects, grading exercises, helping prepare examination questions and correcting the exams.

In 2016 I have been head TA for the Advanced Systems Lab, a project-based distributed systems course at the Master's level. The goal of this course is to build a middleware, measure its performance, model its behavior and reason about the system as a whole. Students find this course both challenging and rewarding because often this is the first time that they are presented with an end-goal and set of possible tools, but without clearly defined steps on how to get there. The explanations and reasoning that the students provide are actually much more important in evaluating their work than, for instance, the quality of the code they write. As a head-TA, I had more influence both on the project definition and on the tutorials we provided to the students to help them with the project work. Organizing this course is challenging because the participating students have very different backgrounds. ASL is in a set of obligatory elective courses and therefore students from all tracks of the Computer Science Master's program will attend.

Future activity. In the future I would like to teach in the area of systems. I am especially interested in teaching courses such as Distributed Systems, Databases, or Parallel Programming, but I could also cover other topics as needed. In addition, I would enjoy holding seminars or leading reading groups that discuss the state of the art publications in hot topics in systems, e.g., programmable hardware accelerators or in-network computation.

Furthermore, I wish to develop a course about data processing on emerging hardware, with a focus on hybrid architectures. Future processors will be heterogeneous and incorporate accelerators, and I would like to create a course that provides hands-on experience in using FPGAs and GPGPUs to offload parts of databases and data science applications. For students, attending such a course would be a rewarding experience because it would require a combination of their knowledge on data structures and algorithms, distributed systems, computer architecture, and parallel programming in novel ways.

Leadership Profile

Supervision approach. I think most students who decide to pursue a PhD are quite determined and know what their interests are. So as a leader it is important to understand what their motivation is and enable them in achieving their goals. For those students who are not ready to drive their own agenda yet, I would try to come up with increasingly loosely defined tasks so that they can transition from guided to independent work. I think the most important outcome of a successful PhD is that the person learns how to conduct independent research and how to formulate their own questions and devise solutions. In the future I hope to be an enabler of such successful students.

In addition to co-advising two Bachelor's students and a semester project, as a TA for Advanced Systems Lab (ASL) I had the opportunity throughout the years of guiding tens of students with their practical work. The project in ASL resembles a Master's thesis in many ways: it builds on state-of-the-art tools and ideas, there are multiple ways of fulfilling the requirements, and a mix of engineering work, measurements, modeling, and report writing is necessary to pass the course.

Group dynamics and diversity. In the future I would like to lead a group in which both individual performance and team-work are rewarded. During my PhD studies I was fortunate to work in an environment that was open-minded and friendly to people of all backgrounds. Our many group retreats and team-building activities have lead to a close-knit community that feels like "home". Based on my positive experience at the Systems Group at ETH Zurich, I would like to create a group where collaborations are encouraged, both within and outside a group, in order to enable students to tackle more complex problems or to identify cross-domain solutions.

Before joining the Systems Group, as a student from Eastern Europe, I faced some amount of prejudice when I went on internships and studied in Western Europe. This has thought me not only to be respectful of people with different backgrounds but also how to mitigate situations where prejudice or cultural insensitivity is involved.

While in systems research in particular, and computer science in general, male researchers dominate in number, at the Systems Group there was also a significant effort in reaching a healthier gender balance. I would like to follow this model and as a research group leader use my connections at Romanian universities to attract women computer scientists to study at Master and Doctoral level, hopefully contributing this way to a better gender and cultural diversity of my future university.