

Teaching Statement

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Teaching is more than pouring out knowledge over students by an expert. When conducting a class with new students, I like to discuss with them Bloom's Taxonomy of Learning in the first session to raise their awareness of the learning process and how our coursework will develop over the term. There are certain advantages in lecturing from a well designed script, but application and making students acquire, apply, or even create more material from the respective class topic leads to more impactful results. I prefer active learning methods to pure lecture style courses. Using paper for drawing sketches and collaborative design, laptops for hands-on demos, live coding, (sometimes competitive) course projects, and web research are common elements of my classes. I always try to develop my classes from specific examples and scenarios and transport this way of thinking to my students. I usually embed a cumulative course project such as a simple database with front-end, a game, an integrated smart thing, or an industry project, which leads to very impressive results from the students. One of my sentences that my students often mock me about is "Let's get our hands dirty". And even if the amount of real physical dirt (apart of used solder or 3D printing waste) is little, the joy and satisfaction I see in my students when actually engaging in the metaphorical dirt on their keyboards is one of the many rewards a passionate teacher is drawing energy from.

Currently, I teach undergraduate classes (algorithms and data-structures, computer architecture, and operating systems) and a graduate class on home and building automation. I have more than seven years of experience teaching courses in software engineering, especially modeling and agile software development. I also have acquired experience in teaching mobile computing and distributed systems. I designed and created two new classes for my current affiliation (University of Applied Sciences Upper Austria): home and building automation and operating systems and computer architecture. For the University of Tartu, I designed: software architecture and systems modeling. I contributed to courses in software engineering, distributed systems, and introduction to computer science and designed small hands-on lectures for mobile computing and academic writing. In software engineering, I teach classes concerning requirements engineering, modeling (especially UML and story driven modeling), and programming in a team; in distributed systems, I teach sessions on desktop cycle harvesting and GPU computing. In addition, I have taught several seminars with a strong focus on improving the academic presentation and writing skills. These seminars involve several peer and instructor feedback cycles. At Nazarbayev University, I taught and designed the courses computer systems and organization, operating systems, and mobile computing. I also taught based on existing teaching material Algorithms and data-structures, web programming and problem solving, and fundamentals of programming. I am currently designing a short intensive Programming Introduction based on an Internet of Things motivation. This class basically teaches fundamentals of programming in C but focusing on a small ESP8266 (Arduino-like) wifi enabled board, Raspberry Pi computers, and several small actors and sensors.

I also consider advising a part of my teaching duties and a very attractive bridge between teaching and research. I have a very strong supervision record and a great amount of students dropping in on a regular basis to discuss their thesis work or to look for new challenging problems. I currently supervise students in Germany and Austria. While working at the University of Tartu, I have increased the number of students writing their thesis on a topic related to our research group from an average of three students to more than six per year.

Not only do I enjoy teaching, but I work hard to continue to develop myself as an effective instructor. I have been involved in two courses to further develop my teaching skills: a semester-long course on active learning as well as a four-day seminar on supervision. These courses along with opportunities to supervise and teach not only make me a reflective and active practitioner but also a sharper and stronger researcher.

In Tartu, I spent a lot of time on team building activities. In my opinion, in an academic context where IT specialists are trained, there has to be taught both programming skills as well as teamwork and communication

skills. As there are issues with communication and collaboration in a team of Estonian students, I developed a collaboration and communication-facilitating game “Mullivelled” in collaboration with three colleagues from various disciplines. The game frame has three phases: playing alone, playing with random team members, and playing with a real collaborating team. We published a paper¹ about this game and presented it at the ISAGA 2008 conference. The development of this idea continued through a new research project called “Orchestration of Educational Computer Game Environments”. Mullivelled is now used at the cultural institute of Viljandi, Estonia as a reference for team building games.

I enjoy traveling and the exposure to and interaction with a diversity of cultures. Splitting my time between the U.S., Austria, Germany, Estonia, and Kazakhstan as a German expatriate has given me insights into a spectrum of different ways to teach and research. For me, teaching is a lot about passion and transporting passion to students or colleagues. I enjoy shaping new courses, redesigning existing courses, and discussing teaching with colleagues.

1 Ulrich Norbistrath, Ivar Männamaa, Anne Villems, Külli Kalamees-Pani : *Mullivelled - Wrapping Computer Games into Educational Gaming Environments*. Games: virtual world and reality, selected papers of International Gaming and Simulation Association Conference (ISAGA 2008, July 2008), Editors: E.Bagdonas & I.Patasiene. Technologija, Kaunas/Lithuania 2009