Teaching Statement (2014)
Jianmei Guo

The opportunity to teach and work with students was a primary reason for seeking an academic career. I enjoy educating the next generation of computer scientists and software engineers. The profound and lasting impact of education in society is a great motivation for me and makes me strive to constantly improve my skills as an educator. My academic background, teaching experience, and industry career as a software engineer and a consultant make me well-prepared to teach introductory programming and computer science courses as well as advanced courses on software engineering, data structures, algorithms, statistical machine learning, and combinatorial optimization.

Experience. In 2002, I worked in an ERP (Enterprise Resource Planning) software company as a software engineer, and soon I gained promotion as a consultant. The main duty of a consultant is to transfer external know-how to the clients. However, most clients I faced had no background in programming and information systems. To this end, I designed and taught my own training course for more than one year, and trained hundreds of clients. This was a great experience, because what I did was not only to deliver knowledge to the clients but also to guarantee that they really grasped how to use a system and understood how to produce actual profits. Due to my excellent performance, I was awarded the Annual Outstanding Employee in 2003.

From 2006 until 2008, I served as a teaching assistant for course “Software Engineering and Practice” (hosted by Prof. Jian Cao) and course “Programming Basics” (hosted by Prof. Yinglin Wang) in the Department of Computer Science & Engineering at Shanghai Jiao Tong University. Both courses were designed for undergraduates. I had the opportunity to exercise my teaching philosophy of combining a solid theoretical foundation with practical hands-on experience. Moreover, with the help of experienced professors, I was able to explore every aspect of running a university course, such as creating a syllabus, choosing textbooks, hiring and coordinating teaching assistants, developing assignments and exams, and preparing and presenting lectures.

Since 2007, I have been serving as a mentor to help supervise undergraduate, master’s, and PhD students through a deep one-on-one interaction. The individual interaction with these students is always inspiring and rewarding. During my doctoral studies at Shanghai Jiao Tong University, I mentored eight master’s students (Jian Li, Guangxin Wang, Helin Wen, Shengyang Luo, Yunhe Mu, Guilin Wu, Qi Xiong, and Rongwei Ye) and three undergraduates (Runyu Shi, Yingjie Lin, and Jie Ke), which contributed to the publication of eleven theses and eight peer-reviewed papers. Currently, I am mentoring five PhD students (Rafael Olaechea, Pavel Valov, Ed Zulkoski, Leonardo Passos, and Yi Zhang) and two master’s students (Hristiyan Vasilev and Atri Sarkar) at the University of Waterloo, which has contributed to the publication of two master’s theses and two SPLC papers as well as a couple of manuscripts in preparation. Two master’s students (Rafael Olaechea and Pavel Valov) I mentored chose to continue their PhD studies within our research group at the University of Waterloo.

In 2013, I attended a teaching development seminar series held by the Center for Teaching Excellence at the University of Waterloo and was awarded a teaching certificate.
I received one-week intensive training in many aspects regarding teaching, including course design, motivating students, assessments and rubrics, interactive teaching, teaching philosophy, and how students learn. It was a great opportunity to build a systematic and correct understanding of teaching.

**Philosophy.** The most important aspect that we are able to teach our students is that the subject we teach is interesting and useful. A student who is interested in the subject is easy to teach, but unfortunately not all students arrive in the classroom in this mood. Hence, it is the first responsibility of teachers to present the subject in an interesting and engaging manner that shows its elegance and beauty as well as its applicability to solving real-world problems and thus to nurture each student’s desire to learn.

For introductory-level courses, it is important to teach students how to approach the subject. It is the responsibility of teachers to combine theoretical foundations with hands-on experience and to balance the two aspects during teaching, so that students are able to understand the subject easily and smoothly.

For higher-level courses, I emphasize active learning via team collaboration, critical review, and real-world feedback. Complex scientific and engineering projects rarely rely on individual work; students must learn to organize and work as teams. Moreover, giving intelligent and objective reviews is important for students to practise their ability of active and critical thinking. Finally, inviting people working in industry to give talks and to evaluate students’ projects is helpful for students to know the state-of-the-art techniques and what happens in the real world.

**Interests.** My experience enables me to teach a range of introductory programming and computer science courses as well as advanced courses on software engineering, data structures, algorithms, statistical machine learning, and combinatorial optimization. In particular, I would like to develop new courses relevant to my current research on “Variability-Aware System Engineering: Modeling, Prediction, and Optimization” (see my research statement). My research spans the areas of software engineering, statistical machine learning, combinatorial optimization, and embedded systems. Thus, the new courses will be cross-disciplinary and data-intensive. Moreover, my current collaboration with General Motors (GM) and Advanced Micro Devices (AMD) will supplement the courses with first-hand knowledge and experience in industry.