Focus on the students, since graduating great students means you'll produce great research, while focusing on the research may or may not produce great students.

by Nico Habermann (1932-1993), inherited by David Notkin (1955-2013)

The biggest attraction of academic careers for me is the opportunity to devote myself to computing education since it brings me the greatest sense of achievement when my passion for computer science and engineering can be passed on to fellow students, and teaching is the most promising way to realize this goal. In the past several years, through extensive experiences in undergraduate teaching, graduate teaching, career advising, and research mentoring, I have prepared myself to excel in teaching and mentoring activities as an independent faculty. In the following text, I will discuss my philosophy, past experience, and future plans for undergraduate teaching, graduate teaching, career advising, and research mentoring respectively.

Undergraduate Teaching. For undergraduate teaching, I believe the main goal is to equip students with professional knowledge and *motivation* to launch their computing careers. Taking this in mind, in undergraduate-level courses, besides knowledge dissemination and application, inspiring students' interests is equivalently important. I was the TA for *Data Structure* course at Tsinghua University, which is a required course for second-year undergraduate students. As a TA, my duty is to design homework assignments, grade them, and hold homework seminars. I deployed my teaching philosophy in this course, where I divided the assignment problems into three parts: one problem category for training in-class knowledge, one problem category with challenging research-oriented algorithms and hints to inspire students' interests in research, and one problem category inspired from real-world applications such as queuing orders at student's dining hall to enlighten students to make real-world impacts. Many undergraduate students were very thankful for the course after several years. I will follow and further develop this teaching philosophy in practice.

My research interests lie in the intersection between machine learning, computer security, software engineering, and theory. Such a diverse background has exposed me and kept me familiar with multiple fields in computer science. As a result, in terms of concrete courses, I am prepared for and interested in teaching *machine learning and its applications*, *deep learning theory*, *computer security*, *cybersecurity*, *machine learning security*, *software engineering*, *logic and discrete math*, *programming languages and types*, *program analysis techniques*, *compilers*, *competitive programming*, *algorithms*, computing introductory course, or related courses. Moreover, I have been actively participating in programming contests since high school, and have won multiple regional and national prizes. I think these experiences qualified me to be a coach for the International Collegiate Programming Contest (ICPC).

Graduate Teaching. For graduate teaching, I believe the main goal is to expose students to research or engineering frontiers and find a perfect match for students' skill sets. To practice this philosophy, I decided to be the only TA for the first version of *AI and logic* course. This course perfectly aligns with my research topic. Since this is the first version of the course, and there is no relevant course in other universities, the instructor and I made great efforts to arrange materials, build infrastructure, design assignments, and adjust logistics. Specifically, I took full charge of course assignments and grading. Inspired by my research infrastructure, I designed a series of lab problems to guide students to implement the whole suite of white-box DL certification approaches. Even as the first version, this assignment went smoothly and all students were satisfied with the course design and grading. Many students developed their interests in certifiably trustworthy DL through the process and some started to conduct further research projects with me. Summarized from the course materials, I finished a one-hour tutorial for outsiders to learn the research frontiers of certifiably trustworthy DL. The tutorial is presented in several webinars and has inspired many peer researchers to study this research topic.

Hence, in the future, I plan to continue lecturing and improving this course *AI and logic*, to discuss and attract students' interest in cutting-edge research on leveraging logic and programming language techniques to enhance the trustworthiness of modern deep learning systems. For students chasing industry careers, I am planning to teach courses on large DL models to disseminate the industry's latest frameworks, techniques, practices, and workflows for deep learning that I learned from past industry experiences. Courses of this type are rarely seen in universities since large-scale industry deployment of large DL models just began, but the industry is in need of mature developers with these skills. Hence,

I will use these courses to equip students in computer engineering and data science with these highly-valued skills to boost their industry careers.

Career Advising. The purpose of education is to develop students' full potential and let them become successful members of society. To achieve so, aligning an individual's interests and skills with the careers they choose could be the key. During my Ph.D. study, I volunteered to be a student mentor for new Ph.D. students and a graduate ambassador for prospective Ph.D. students in UIUC computer science. In these services, I helped junior Ph.D. students, especially those from underrepresented groups, to align their interests and skills with potential research areas and groups. In the future, I am more than happy to take this service role and work with both undergraduate and graduate students to plan their suitable career paths.

Research Mentoring. To be a faculty member in a research-oriented university, just as Nico Habermann said, it will be my duty to educate students to become independent researchers. My philosophy here is to go through the whole scientific discovery, publication, and presentation process with the student in a dynamic involving manner. Canonically, following Bloom's taxonomy of learning, I think an independent researcher in computing research possesses a diverse set of skills that can be roughly divided into three levels: Level 1—familiarity with theory, algorithms, tools, scientific writing, rebuttal, and presentation skills; Level 2—capability of planning, executing, managing, and organizing research projects; and Level 3—learning, evaluation, and critical thinking upon peer research results, development of own's opinion of the field, and innovation. When going through the research process with students, we should involve dynamically in different forms and different manners based on the level of skills. For level 1 skills, I will mentor students in a direct teaching way, since these skills correspond to fixed knowledge and experience in computing research. For level 2 skills, I will mentor students by suggesting effective and suitable ways based on students' characteristics, since each individual acquires and possesses these skills in different forms. For level 3 skills, I will mentor students by guiding students to think towards these questions and learn by themselves in an open-ended manner, since these skills can only be learned by self-retrospect and in-depth thinking. Throughout the process, another key responsibility of our educators is to preserve the student's interest and motivation by encouraging them from negative feedback (e.g., negative experimental results, negative reviews, rejections), since interest is the best teacher.

By applying this set of philosophies, I have conducted several successful co-mentorship with multiple undergraduate students, master students, and junior Ph.D. students. Many of them are from underrepresented groups. These mentorships not only lead to top publications (ICML'21, ICML'22, NeurIPS'22, SatML'23) but also, more importantly, inspire students' interest in computing research and many of these undergraduate students now have continued their careers in research-oriented graduate programs. In the future, I will still follow this set of philosophies to mentor and educate students, with a focus on students from underrepresented groups, to be independent and impactful researchers.