Graduate Student Mentoring Philosophy: Christopher Kruegel

My goal as a mentor is to support the academic, professional and personal growth of my graduate students and to prepare them for a successful career. I view graduate school as an apprenticeship in science, where I closely work with students to train them in the process, the art, and the joy of scientific discovery, validation, and dissemination. When graduate students start on their path, they typically possess strong technical skills and a solid understanding of computer science. My goal is to turn them into intellectually curious and independent thinkers that can identify novel and impactful problems. I aim to guide them so that they can develop promising ideas to solve these problems, critically question their solutions, and rigorously and systematically evaluate the merits of their work. Of course, this must be done with integrity, and I hope to act as a role model for the necessary ethical conduct when dealing with setbacks, disappointments, and failed experiments.

Fostering intellectual growth is a delicate balancing act between prescriptive guidance and explorative freedom. On one hand, it is necessary to provide students with enough room to experiment with their own ideas and projects. On the other hand, it is critical to provide structure and support so that students do not feel overwhelmed or lost. My approach to address this balancing act is to allow students to gradually grow more independent. When a student joins the lab, I will propose a few concrete project ideas that have a reasonably clear path to completion. As students mature (and maybe have already published papers), they increasingly propose their own projects. At this point, my role turns into that of a critic who challenges their assumptions and proposed solutions. For any project, a key tenet is that the student is passionate about their research. If they do not feel a desire to work on a problem, the outcome is rarely good, and I have always been supportive when students decide to change their path. To provide direction, I try to be always available for meetings when students seek feedback, I run a weekly group meeting, and I schedule follow ups where we can dive deep into technical questions. I am happy and proud to see that many of my former PhD students who have since joined academia emulate this model to run their own research groups.

It is important for me to prepare students for their life after graduation and to support their professional development. Of course, the specific type of preparation needs to be tailored to the student's goals. When a student expresses their interest in academia, I aim to expose them to tasks that they will encounter in their future faculty career. For example, I involve them in grant writing, where senior students can contribute to shape a broader research vision for a project. And I recommend them as junior members for workshop and conference program committees, so that they can experience the other side of peer review. I also encourage PhD students to visit another university lab for at least a summer. This helps them to see how other professors organize their research groups, and they can develop a more informed vision of how they would later like to advise their own students. A stint in another lab also helps with recommendation letters, which are critical for securing faculty positions. Instead, if a student instead plans a career in industry, I tap into my own professional network to help with internships. This provides students with a firsthand view into a potential future workplace. I also ensure that senior graduate students have the possibility to advise other students – junior graduate students or summer interns – so they can improve their own leadership skills.

Finally, I strongly believe that mentoring goes beyond just supporting academic and professional growth. I strive to create a welcoming and inclusive environment for all students where collaboration is strongly encouraged, and mutual respect is nonnegotiable. Over the years, I have seen an increase in students who suffer from significant stress and mental health issues. I take these issues extremely seriously and provide all the support that I can. I emphasize the importance of work/life balance and never demand "heroics" where students are pressured into work through many days and nights before deadlines. I also actively recommend that students do not work alone on projects but find collaborators to bounce off ideas and share their frustrations. This is why most of our papers end up with several student co-authors. Finally, I organize a yearly retreat for the lab where students spend a few days together away from the university to get to know each other and enjoy some time together.

Mentoring young scientists is a tremendous privilege. I have learned a lot from my students and have become a better scientist and leader because of them. It is a true pleasure to see students grow into successful researchers and professionals and to experience all their excitement, joy, and energy.