My teaching philosophy is to cultivate critical thinking skills in students. Rather than simply presenting materials in existing literature to students, I want to foster a mindset in students to reason and criticize any ideas like scientists. I have developed my teaching skills through my experience as a teaching assistant for the course "Communication Networks". I have also co-taught the course "Advanced Topics in IoT" with faculty where I gave lectures on "Machine Learning for Image/Video Compression", "Brief Introduction to System Research", and "How to Read System-Machine Learning Papers Critically". Besides, I have rich experience in mentoring undergraduate, Master's, and Ph.D. students in immersive computing. Regarding teaching interests, I am prepared to teach graduate courses such as Distributed Systems, Wireless Networks, Multimedia Computing, and Virtual Reality. I am also eager to teach undergraduate courses including Data Structures, Computer Networks, Operating Systems, Digital Image Processing, and Signal and Systems. Additionally, I would like to develop a new course for undergraduates and graduates that introduces AI-system co-design for immersive computing systems.

Teaching Philosophy

I believe that logical reasoning and objective analysis are two key abilities that underpin critical thinking, and I strive to equip my students with these skills throughout my teaching. ❶***Logical reasoning:*** Rather than simply presenting steps behind a method, I provide contextual information and hints, prompting students to actively reason about the idea behind complex concepts. For example, when co-teaching "Advanced Topics in IoT" at UIUC, I was responsible for introducing the video compression standard MPEG. MPEG is a foundational work for video compression, but the technique behind MPEG is not intuitive. Rather than reiterating what MPEG is doing, I let students propose their efficient way of storing a video frame. It is not hard for students to find the "motion" between a frame and the previous one is an efficient way to describe a frame. Then, I asked students how to deal with the content that did not exist in the previous frame. This question is not easy to answer, so I explained that MPEG would calculate the difference between the previous frame and the current frame predicted with the motion, termed the residual. Motion and residual are two key components of MPEG. I found students can gain a deeper understanding of complex concepts in this way and develop their research ideas with the same reasoning process. ❷***Objective analysis:*** In my classes, I teach students to critically evaluate the strengths and, equally importantly, the limitations of research papers. While I was co-teaching "Advanced Topics in IoT", I gave a guest lecture on "How to Read System-Machine Learning Papers Critically." I explained the significance of components (*e.g.,* problem formulation and motivation) in papers on system and machine learning, common pitfalls, and good practices with examples from top-conference papers. During the class, I also encouraged students to think about the limitations of a paper. For example, I would ask students if the assumption of the paper is too strong, if the method is well-motivated, and if the experiment is sufficient enough to support the results. I found students can get in-depth thoughts about a paper when analyzing a paper in such an objective way. This capability would benefit students when reading papers or developing research projects and cultivating good research tastes.

Teaching Interests

At the undergraduate level, my teaching and research experience allows me to cover a wide range of courses including Data Structures, Computer Networks, Operating Systems, Digital Image Processing, and Signal and Systems. Given the need, I am qualified to and would readily commit the effort required to teach undergraduate classes in these subjects effectively.

For the graduate level, because of the scope of my current research, I am specifically eager and excited to teach Distributed Systems, Wireless Networks, Multimedia Computing, and Virtual Reality. In addition, I am also interested in developing and teaching new non-conventional courses such as a course that discusses AI-system co-design for immersive computing systems including topics such as sensors, networking, systems, virtual reality, and machine learning to students. I believe this course, an interdisciplinary field covering computer networks, distributed systems, and machine learning, would spark their interest in immersive computing and equip them with solid systems and AI tools.

Advising Approach

I have mentored numerous undergraduate, Master's, and Ph.D. students from the University of Illinois at Urbana-Champaign, Princeton University, and George Mason University. ❶***One of the key challenges is to create a collegial atmosphere where everyone feels comfortable expressing and debating their ideas.*** During my postdoc, I have weekly meetings with students (at most four concurrently) to discuss research separately. During these meetings, I brainstormed with them, proposed new ideas, and explained to them how I formulate research questions from real-world problems. For instance, while I and a student were brainstorming methods to express human intent underwater when humans cannot speak, I proposed to the student the idea of using hand gestures and images and turning them into voices using Large Language Models. Even if this idea seems naive initially, I shared it to encourage students to share their thoughts as freely as I do. ❷***It's also important to adapt the advising style based on the student's experience level.*** For undergraduates with less experience, I focus on hands-on guidance, providing concrete ideas and recommending specific tools for implementation. For example, I guided one student in setting up a neural codec by following instructions from a GitHub repository. In contrast, with Master's and Ph.D. students, I help them understand the broader context of their projects. For instance, I worked with one student to combine his ideas of achieving energy-efficient video analytics with efficient filters into a cohesive narrative, with concrete motivation, challenges, and novelty. As such, I can effectively engage students from diverse backgrounds and experience levels. ❸***Finally, I firmly believe that patience is the greatest virtue in advising.*** Every student has their own optimal learning pace. While it may be tempting for advisors to push for higher productivity, this can harm students' interest in research and their mental health, crucial for their long-term success. Instead, I spend time finding out where the students struggle and helping them resolve the problem, which allows students to steadily progress and enjoy their continuous achievements. For instance, one of my students was stuck by a shallow frame rate in his video streaming pipeline. I looked at his code, noticed the problem was the unnecessary image writing into the storage, and helped him resolve that problem. I also told him that it is fine to be slowed down in research as long as he is moving forward.

Conclusion

Teaching is not only a responsibility but a pleasure. I am eager to inspire and assist students, regardless of their backgrounds or performance levels, in discovering the enjoyment and potential within this field.