

Teaching Statement

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"We conclude that the work of the professoriate might be thought of as having four separate, yet overlapping, functions. These are: the scholarship of discovery; the scholarship of integration; the scholarship of application; and the scholarship of teaching."

— Ernest L. Boyer, *Scholarship Reconsidered* [1]

Teaching and mentoring have been among the most rewarding parts of my academic journey. I believe that nourishing the next generation of systems researchers begins with sparking curiosity at a very early stage, then building the skills and confidence to pursue it. Through course design, classroom teaching, mentoring, and community building, I aim to build such a pathway that engages students in computer systems research from elementary school through graduate education. I want students to *discover new ideas in systems, connect knowledge across adjacent fields, and apply what they learn to build better systems in the real-world*. Above all, I want them to **remain curious**: to ask why a system works as it does, question its assumptions, and imagine how it could work differently. As AI makes advanced knowledge and cutting-edge research increasingly accessible to everyone, I believe educators have an even greater responsibility to help students understand the ideas accurately, develop the judgment to critically evaluate them, and build upon them to create new knowledge.

Teaching

Teaching the reasoning behind system design. I have contributed to the course design and teaching of two graduate courses at UT Austin. I helped develop the curriculum for the first offering of CS 395T: *Principles of Learned Systems* in Spring 2024, returned as a guest lecturer in Spring 2026, and also independently designed and taught a one-week AI for Networking module for CS 395T: *Advanced Computer Networks* in Fall 2026. A central challenge in teaching this emerging AI for systems field is selecting representative research works and organizing diverse systems problems and learning techniques into a coherent intellectual framework.

I organized the research works along three axes: system component, problem category, and AI strategy. I used these connections to organize two parts of the Learned Systems curriculum: what they use learning to solve, and common concerns for real-world deployment. In the AI for Networking module, I used learned congestion control as a AI-driven network controller design case study, and then used learned adaptive bitrate selection to highlight the community's efforts to bridge the gap between learning methods and real network data. By connecting individual papers through the evolution of a research problem, I aimed to help students critically evaluate existing work, recognize connections across topics, and identify opportunities for new research. Designing and teaching these courses also sharpened my own understanding of the field, revealing connections and unexplored intersections that inform my research.

Connecting abstract concepts to hands-on experience. I served as a teaching assistant for courses in programming, engineering, data structures, and operating systems at the University of Wisconsin–Madison and Shanghai Jiao Tong University. One major difference for undergraduate course design is that the courses need to give students concrete opportunities to apply the abstract concepts learned in the classroom.

When I took Introduction to Operating Systems (OS) as a junior, I noticed that the two major course projects only gave us hands-on experience with shell and concurrency. The other OS concepts remained largely abstract and were assessed mainly through written exams. Returning as lead teaching assistant in my senior year, I led the design of additional labs on topics such as memory management and device drivers, where I guided the students to test real usage of OS policies and designed simple programming exercises. These labs complemented the larger projects, connecting lecture concepts to students' hands-on experience with the operating system.

Teaching Agenda I am prepared and eager to teach undergraduate and graduate courses in computer networking, operating systems, distributed systems, and introductory computer science. Additionally, I would like to develop courses in special topics related to my research, including AI for systems, datacenters, cloud computing. These courses will help students trace the development of research ideas and start capstone or research projects for new ideas in these areas. I'm also interested in writing a textbook on principles for AI in systems with my knowledge of the field.

Nurturing the Next Generation of Systems Researchers

Throughout my PhD, I have mentored more than 20 undergraduate students and a few junior PhD students across a range of projects. In addition, I have led the effort to build a pipeline at UT Austin preparing future system researchers from elementary students to undergraduate students.

Adapting mentorship to individual students. Lynn, the first undergraduate I mentored during my PhD, joined as a highly motivated senior who could carry out research independently. She nevertheless valued detailed discussions of experimental plans before proceeding. I worked through these plans with her, encouraged her to pursue her own ideas, and provided feedback as she explored them. My support focused on helping her develop confidence in her judgment while giving her room to direct her work, and she went to UC Berkeley for her PhD degree.

Aryan joined as a freshman with strong implementation skills but little research experience, so I gave him a lot more hands-on guidance for research. We began with a concrete project on data placement in a multilevel cache. Recognizing that the project did not fully engage his interests, we built on that experience to explore how relationships among objects could improve caching. His participation and initiative grew considerably as we pursued this question. To support his ideas, I guided him to relevant papers, and discussed how to implement and evaluate his proposals and alternative approaches. Aryan was recognized as a UT CNS Dean's Honored Graduate, and now works at Jane Street.

Building pathways into systems research. I lead the undergraduate program for the Learning Directed Operating System (LDOS) Expedition, *supporting 50–60 undergraduates engaged in LDOS research each year*. My goal is to *create pathways into systems research for students with different levels of preparation*.

In the first semester, I organized a reading group with 43 students across UT Austin, UW–Madison, UIUC, and UPenn to introduce undergraduates to foundational papers for the expedition. I noticed two groups of students. Students with stronger backgrounds readily engaged in paper discussion and asked insightful questions, while another subset has less knowledge with underlying ML and systems concepts and practical tools such as SSH and Git. This motivated me to build an inclusive research community with multiple entry points and clear opportunities to progress.

I developed three complementary pathways: a graduate-student-led reading group for exploring current research; a Directed Reading Program (DiRP) with 33 students for building foundational knowledge and practical skills; and the expedition's first formal undergraduate research program, bringing together undergraduate students working on LDOS research. I established a recruitment process to connect prepared students with research opportunities, with the reading group and DiRP helping newcomers develop the background to participate. Together, these pathways support students as they move from an initial interest in systems to active participation in research.

To support students through common research challenges, I organized monthly workshops on reading papers, giving presentations, and exploring careers in industry and academia. Student surveys revealed another need: opportunities to get to know one another and learn about each other's research. In the program's second year, I added monthly meetings where students shared their projects. These discussions encouraged students to ask questions beyond their own work and helped build a community in which they could learn from one another.

I extend this effort to spark initial systems research interests to younger students at elementary school to middle school by making systems tangible through familiar devices. For UT Austin's STEM Girl's Day in Spring 2024, I organized the *Inside the Operating Systems* booth around disassembled phones and computers to reveal the complexity inside familiar devices. Children could see processors, memory, storage, and network interfaces and ask how these components worked together. The booth attracted many children, including those encountering these ideas for the first time. These encounters offer an early opportunity to develop the same curiosity about system design that I encourage in my courses and research programs.

When Aryan graduated, he wrote me a note. "It has been wonderful working with you for the past 3 years. You have been patient, encouraging, and believed in me more than I believed in myself. You have a wonderful, positive energy that everyone in the room can feel. I wish you the best going forward. Thank you for everything." Watching him grow to become an independent future system research has been the most rewarding experiences of my PhD. Our learning was mutual. As he developed as a researcher, I grew in my understanding of both research and mentorship. As a faculty member, I hope to offer more students that same guidance, encouragement and belief, helping them turn curiosity into concrete research skills and confidence in their research journey.

References

- [1] Ernest L. Boyer, Drew Moser, Todd C. Ream, and John M. Braxton. *Scholarship reconsidered: Priorities of the professoriate*. John Wiley & Sons, 2015.