

My teaching philosophy is influenced by practical knowledge and experience needed to apply the learning to real-life situations. This comes from teaching entry-level to advanced courses. Computer Science is at the core of diverse scientific disciplines, where automated solutions require scalable, robust, and efficient algorithms in computer science. Therefore, a vital part of any computer science curriculum, particularly in entry courses, requires students to write about concepts and problem-solving processes. For students who are still developing their programming skills, giving them an alternative technique for working with course materials will facilitate ultimate understanding and the vital skill of technical writing. Furthermore, the latter would better teach students throughout the entire curriculum. Moreover, it would enable students to learn and apply algorithms to support research with interdisciplinary researchers in the university, and industry personnel, resulting in publications and internships for my students.

My methodology of teaching is also tied with my proclivities to mentor students. In the courses that I will teach, I will push towards project-based learning. This had worked very well in the past when I co-instructed the Advanced Semantic Web course for two semesters with my advisor. It feels self-empowering when students who took this class show rewarding results in their success in internship interviews and landing a full-time job with competitive compensation. In addition, I have served as teaching assistants for artificial intelligence, software engineering (software quality assurance, requirements engineering, and others), introduction to programming, and operating systems. Each of these courses comprised students from undergraduate and graduate levels. As my responsibility to hold office hours, doubt sessions, and lab sessions, I presented students with the necessary mathematical background and real-world experience, helping them view computer science as a problem-solving field. For example, in an operating systems class in which students were implementing a small compiler, I gave a lecture on the natural language task of parsing English sentences, introducing an interesting artificial intelligence problem, and showing students what they learn in one classroom will be relevant in others. As a teaching assistant, whenever I get a chance to hold lab sessions, I show the students a new problem that may be solved by insight from a seemingly unrelated problem.

Mentored Teaching Experience

As a mentor, I seek to contribute to the development of the whole person (e.g. student in a course, mentee or Ph.D. student). This requires some understanding of the current state of my intellectual and professional development and my dreams for the future to be a tenure-track assistant professor. Throughout my Ph.D. I mentored different graduate and undergraduate students from diverse communities. Each of my mentees has different goals and requires different skills. Still, I aspire to help my mentees develop certain universal skills such as recognizing opportunities, asking questions, acknowledging shortcomings, and communicating effectively. As a mentor, I have supported my mentees in developing a rich line of research leading them to apply for awards, fellowships, and similar opportunities. For example, after successful co-authored publications in PLoS-One and IEEE ICHI, two undergraduate students succeeded in achieving Google AI Resident Fellowship and internship in Episource LLC. At the same time, the undergraduate students got admission to graduate school at UC Berkeley and the AI Institute at the University of South Carolina.

I always admired diversity in learning and education. As a part of the SC-ADAR¹ program in South Carolina, I had the privilege to mentor undergraduate students from HBCU and HACU colleges. One undergraduate student received a Bridge-to-Doctorate fellowship based on high-impact research in mental health, demonstrated during the SC-ADAR symposium. Recently, I cherish the accomplishment of my mentee, who received a lucrative offer from Groupe SEB based on the successful demonstration of her model on time-series forecasting of spare parts for the manufacturing division within Groupe SEB. These success stories developed a practice of collaboration and evolved my mentored teaching experience in cross-disciplinary and diverse teams. I found it good practice for working with graduate students and colleagues and being a member of a community of research practice. After taking up a tenure track assistant professorship, I would motivate my graduate research assistants to help supervise the work of undergraduate researchers.

Tutorial and Workshop Experience

Tutorials and Workshops are another fantastic way to disseminate your knowledge to a broader audience. Through tutorials, you can gauge the response and acceptability of your topic (not necessarily a research topic), and you have a chance to improve your teaching materials from feedback. Also, it is a perfect opportunity to amend your class curriculum

¹ South Carolina-Advancing Diversity in Aging Research (SC-ADAR) (<https://scadar.cosw.sc.edu/>)

with research work submitted to the organized workshops and questions/responses obtained through tutorials. The students will learn the potency of the topics in research and allow them to cultivate prowess in writing research articles that are publishable in workshops and conferences. I plan to continue organizing tutorials and workshops on topics aligned with my research interests and those of the faculties in the department where I will be appointed as an assistant professor and seek interdisciplinary collaborations within the university.

Grant Writing Experience with Mentoring

Grant writing is another useful developmental activity that is influenced by your teaching methods and mentored teaching experience. In a project-based learning class, I happened to discuss novel research topics and methods with graduate students. Over the course of the class, the research ideas take shape with concrete problem definition, literature survey, and preliminary results. I had an opportunity to work with some graduate students and leverage my grant writing experience to play a significant role in supporting my advisor in the success of various competitive NSF and NIH grant proposals. Recently, together with a graduate student in computer science and my advisor (PI), we won an NSF EAGER grant proposal (PI: advisor) on Neuro-Symbolic Artificial Intelligence. As a lead contributor to this proposal, I can transfer a significant amount of grant funds to another institution where I will start my faculty appointment. Another success I received was through a collaboration with Prof. Philip Resnik (Univ. of Maryland, College Park) and Prof. Maria Liakata (Alan Turing Institute, UK) in winning the EPSRC-UKRI grant on “Time-sensitive sensing of language and user-generated content.” Much of this grant success reflects my teaching philosophy, where I got a chance to work shoulder-to-shoulder with my mentor as well as mentored students in crafting a project idea that ultimately expands to a grant proposal.

Diversity in Teaching

Ensuring that computer science classrooms incorporate a diversity of learning techniques will encourage a diversity of students. I learned this from my advisor’s past research group at Wright State University (Kno.e.sis Center) and the current AI Institute at the University of South Carolina. The research group reflects excellent diversity by gender, race, experience, and discipline. Further, all the students have an opportunity to see problems both within and outside their intellectual comfort zone, which drives their research vigor. I seek to combine my experience in adapting to such research environments in my computer science curriculum design to attract and retain students who traditionally turn away from the field. The women in engineering, women in technology, etc., are some of the groups I have appreciated through my Ph.D. career and saw many indications that one of the powers of cooperative learning for encouraging diversity is the resulting strengthening of the classroom community. Reflecting the spectrum of backgrounds and interests of one’s students is another vital component, which can be incorporated in part to diversify the course topics in computer science.

My enthusiasm for introducing computer science problems and techniques to novice students, particularly those who may not be familiar with the field through traditional routes, means that I would enjoy teaching introductory courses (e.g. Introduction to Artificial Intelligence, Machine Learning Fundamentals, Numerical Analysis and Computing, Introduction to Data Science, Foundations of Knowledge Representation, Principles of Information and Data Management) whether as a computer science survey or a programming class, or intermediate courses in Mining Massive Datasets, Natural Language Processing, Pattern Recognition: Theory and Applications, Computational Modeling and Thinking, Introduction to Optimization and Modeling, and Social Network Analysis and Mining. Of course, I am equipped and enthusiastic about teaching any of the core courses, such as Data Structures, Algorithms Design and Analysis, Mathematical Foundations of Computer Science, Introduction to Software Engineering, Operating Systems and Database Systems. My research background strongly prepares me for teaching upper-level courses in Massive Data Storage, Retrieval, and Deep Learning, Advanced Topics in Deep Learning (e.g., Deep Generative Modeling), Natural Language Understanding and Conversational Systems, Anomalous Pattern Detection, Advanced Topics in Social Network Analysis and Mining, Healthcare Informatics, and Human Centered Computing. I plan to introduce seminar-level courses in knowledge graphs and knowledge-infused learning (includes neuro-symbolic AI and significantly extends Knowledge-based AI) as Special topics in AI or Selected Problems in Computer Science, Data Science for Social Good as Special topics in Data Science, and Trusted AI as Topic in Artificial Intelligence. My goal in any courses I undertook would be to put into practice the methodologies described above while ensuring a solid integration with the college of computing’s curriculum as a whole.