My teaching philosophy is deeply inspired by Professor Walter Lewin, an astrophysicist at MIT, whose engaging and demonstrative teaching methods brought complex physics concepts to life. His ability to make learning fun and interactive resonates with my belief that effective education should inform and inspire. I strive to emulate this approach by incorporating hands-on, project-based learning, active engagement, and modern tools such as generative AI to make computer science concepts practical, accessible, and exciting for students.

Philosophy and Approach

I believe in "learning by doing," where students actively engage with the material through real-world projects and demonstrations. Practical learning encourages students to deeply understand the subject while fostering curiosity and confidence in applying techniques to solve real-world problems. To implement this effectively, I will use *active learning strategies*, a *flipped classroom model*, and generative AI tools to enhance learning. The flipped classroom model allows students to explore foundational concepts at their own pace using pre-class resources, such as lecture videos and readings. Classroom time is then dedicated to interactive discussions, group problem-solving, and practical activities. For example, in my algorithms courses as a teaching assistant, I guided students through coding challenges and collaborative projects, enabling them to apply theoretical knowledge in meaningful ways. Generative AI can augment this process by enabling students to explore concepts interactively, for example, by simulating algorithms or generating personalized examples based on their progress. As an AI researcher, I am committed to making research deployable with practical applications. This principle is reflected in my teaching, where I integrate real-world examples and interdisciplinary case studies drawn from my work in causal AI, digital health, and smart manufacturing.

Safe and effective use of generative AI in teaching

The advent of generative AI has opened new opportunities for enhancing education, and I am committed to promoting its safe and effective use in my teaching. For instance, I encourage students to use generative AI tools like ChatGPT to brainstorm ideas, debug code, or explore multiple perspectives on a problem. However, I also emphasize the importance of critical thinking, ethical use, and awareness of potential biases in these tools. In my courses, I incorporate lessons on evaluating the reliability of AI-generated content and recognizing its limitations. For example, when teaching about causal AI or algorithms, I guide students in leveraging generative AI to draft initial solutions while validating results through peer discussions, manual testing, or academic research. This enhances learning and prepares students for the responsible use of AI in their careers.

Mentorship and teaching experience

I firmly believe in sparking an early interest in computer science and AI. I have had the privilege of mentoring students at various levels— high school, undergraduates, and graduates—through advising, mentoring, and teaching. For example, I mentored *two high school*, *five undergraduates*, *four master's*, and *one Ph.D.* student. The high school students worked on using causal AI to study the influence of social media on the stock market and qualitative exploration of mobile asthma applications in their effectiveness in asthma management (in a team with an undergraduate). At the undergraduate level, I worked with students from multiple disciplines. My work with the College of Nursing undergraduate led her to receive the best poster award at the college level. At the graduate level (both MS and PhD), I collaborated with students on innovative projects in smart manufacturing and digital health (e.g., *kHealth*), bridging academic research with practical deployment.

During my Ph.D., I was a ***teaching assistant*** for three courses, including twice for algorithms. These experiences allowed me to mentor students on assignments, promote good coding practices, and provide career perspectives in computer science. My sessions emphasized hands-on learning, where students worked on coding

challenges and real-world applications. Additionally, I served as a teaching assistant for the Artificial Intelligence Summer School for high school students where I delivered lectures on my research in causality. I delivered a talk in a graduate level course on Seminar in Advances in Computing. For each talk, students were asked to write a short summary of the talk and their learning experience as part of their assignment (*I received the feedback attached)*. These experiences underscored my commitment to making AI accessible and engaging for younger learners. I have honed my ability to extend my research and explore new, pressing research directions by delivering a ***tutorial*** on *"Causal AI in web and healthcare"* at the Web Conference, an ***invited talk*** on *"Causal Knowledge Graph"* at the workshop on representing and reasoning with imperfect knowledge at Knowledge Graph Conference (KGC), and ***organizing workshop*** on my dissertation Causal NeSy AI at Extended Semantic Web Conference (ESWC) 2025.

1. "In the 14th seminar, Utkarshani gave us a great speech about "Synergy between Neuro-Symbolic and Causal AI and its Industrial Use cases". The seminar on Causal Neuro-Symbolic AI provided an in-depth understanding of how combining causal reasoning, symbolic AI, and neural networks can lead to more transparent, robust, and adaptable AI systems. I was also specifically impressed with the way the speaker broke down her explanation of such a complex topic. Not being much informed about this topic before, I came away with a clearer understanding."
2. "This was by far the best presentation provided with enough details to understand the concepts but not too much that it becomes overwhelming. The concepts were provided with crisp clarity with light hearted moments that made it feel like an interesting YouTube video. I found myself at peace and able to understand every word. The slides too were fantastically good with enough text to grasp the concept. Flow of the session was the most enjoyable. A review on soon to be Dr. Jaimini : you would be one of the most enjoyable professors to study a course under and I'm pretty sure that students would line up to choose your courses ☺".

Students feedback for my talk in Seminar in Advances in Computing

Diversity and inclusion

My experiences at Kno.e.sis Center at Wright State University, AI Institute at the University of South Carolina, along with participation in organizations like AnitaB Grace Hopper Celebration, ACM CRA-WP (grad cohort for women), Women in Machine Learning (WiML), ACM OCWiC, and TriWiC (Ohio Women in celebration) have taught me the transformative impact of diverse research environments. To cultivate diversity and inclusion, I will use collaborative learning approaches and advocate and encourage involvement in organizations that promote diversity and inclusion, which will further provide mentorship and role models for underrepresented groups. I will combine my experience adapting to different research environments and backgrounds in my curriculum design to attract and retain students who traditionally turn away from the field.

Teaching agenda

As a faculty member, I envision designing courses that merge foundational computer science concepts with advanced AI topics. I would enjoy teaching courses such as Introduction to Causal AI, Neuro-symbolic AI, Semantic Web, and Foundations of Knowledge Representation. In addition, I'd like to design a seminar on new emerging technologies and their innovative applications to prepare the students for both research and industry job market. I'd also enjoy teaching novice students and familiarizing them with the field's introductory courses, such as Introduction to AI, Machine Learning Fundamentals, and Introduction to Data Science. My research background strongly prepares me to teach upper-level courses such as Healthcare Informatics, Information Retrieval, Bayesian Networks and Decision Systems. My teaching approach will emphasize project-based learning within a flipped classroom setting, where pre-class preparation enables deeper exploration of topics during interactive sessions. I will also incorporate active learning strategies, such as case studies, role-playing exercises, and coding sprints, alongside the responsible use of generative AI tools to foster innovation and critical thinking. Teaching is more than disseminating knowledge; it is about cultivating curiosity, mentoring potential, and empowering students to realize their aspirations. By combining Professor Walter Lewin's philosophy of engaging teaching with my research-driven, project-based approach, active learning strategies, flipped classroom models, and safe use of generative AI, I strive to create a learning environment that nurtures critical thinking, creativity, and confidence. Through my teaching, I aim to inspire the next generation of computer scientists and innovators to make meaningful contributions to technology and society.