The growing demand for cloud computing and AI highlights the need to train engineers and scientists who both excel in computational methods and understand the sustainability implications of their work. While students are eager to engage in this challenge, current curricula often overlook societal decarbonization and sustainable computing topics. I aim to bridge this gap by introducing these critical topics into the classroom, fostering collaboration across disciplines, and encouraging diverse participation. With experience teaching, guest lecturing, and mentoring students, I am prepared to equip the next generation with the technical expertise and interdisciplinary perspective needed to address computing's sustainability implications responsibly.

Teaching Interests I am a quintessential interdisciplinary person with an undergraduate degree in electrical power engineering, a master's in energy systems engineering, a Ph.D. in computer engineering, and research experience on core computer science problems. Therefore, I can *teach courses on core computer systems topics*, such as computer systems engineering, distributed systems, cloud computing, high-performance computing, embedded systems, and mobile computing. I would also like to *teach elective courses or offer seminars on research-related topics*, such as sustainable computing, datacenter energy systems, energy and environment, computer systems and society, societal decarbonization, heterogeneous computing, elastic computing, metrics in sustainable computing, and lifecycle analysis in computing.

Teaching Philosphy Beyond helping students develop technical expertise in computer and energy systems, my teaching will be guided by four key considerations. First is *environmental consciousness*: I will emphasize the environmental impacts of computing and prepare students to design sustainable, resource-efficient systems. The second is *impact orientation*: I aim to inspire students to drive innovation, scale solutions, and contribute through climate-focused efforts. Third is *hands-on learning through rapid prototyping*: I will encourage experimentation and iteration through prototyping, fostering a classroom environment rooted in discovery and practical application. Fourth is *prioritizing simplicity*: I will stress simple, interpretable solutions that enhance efficiency, safety, and maintainability. By focusing on these principles, I will prepare students with the skills, insight, and adaptability needed to address complex challenges responsibly.

Teaching & Mentoring Experience As a teacher and mentor, I will bring substantial experience in lecture delivery, mentoring, community development, and course management expertise gained as a teaching assistant.

❶ – Mentoring I have had the privilege of mentoring over two dozen students (13 Ph.D., 2 master's, and 9+ undergraduates) across different institutions. Under my guidance, *my students have published 27 first-author papers at top computer and energy systems venues*, with over 10 additional works under review. My mentoring approach focuses on tailoring guidance to each student's strengths, fostering a collaborative and supportive environment. This approach has led to impactful outcomes, such as an undergraduate I mentored at UMass Amherst who shared, *"Working in Professor Shenoy's lab and learning from senior lab member Dr. Noman Bashir has been a great motivator for me to apply for graduate school."* The student is now pursuing a Ph.D. at CMU. Our joint work on residential heating decarbonization earned the Best Paper award at IGSC. In mentoring, I am committed to diversity in gender (12 male, 12 female), and race to ensure an inclusive and enriching mentoring experience.

❷ – Lectures and Tutorials Since Spring 2022, I have *delivered an annual lecture on sustainable computing* in Prof. Prashant Shenoy's Distributed and Operating Systems graduate course at UMass Amherst, highlighting computing's environmental impact and its role in improving societal systems' efficiency. In Spring 2024, I *co-taught a graduate seminar on Machine Learning for Decarbonizing Electric Energy Systems* with Prof. Marija Illic, focusing on ML/AI applications for electric grid modeling, control, and fault diagnostics. To go beyond a single classroom and scale these efforts, I collaborated with IBM's Madeline Gonzalez Allen to *develop an on-demand session for the 2024 AASHE conference*, providing resources for educators to integrate AI's environmental implications into their teaching [1]. Additionally, I revived and co-organized *The UMass Turing Summer Program*, a three-week initiative for high school students exploring how computing addresses challenges in areas like healthcare and energy [2]. In 2024, I also participated as a speaker, delivering a lecture on unique energy sources.

❸ – Community Building Building a community for students and researchers in energy systems and sustainability is vital. In 2023, I *co-launched the ACM SIGEnergy Graduate Student Seminar* with Prof. Zoltan Nagy from UT Austin, creating a monthly platform for graduate students to present their work to peers and mentors globally. The seminar bridges knowledge exchange between ACM e-Energy and ACM BuildSys. Since 2022, I have also *co-chaired the annual SIGEnergy Workshop on Societal Decarbonization (SoDec)*, fostering discussions on challenges and opportunities for societal decarbonization. I will also *lead the inaugural SIGEnergy Workshop on Computational Decarbonization (CODEC)* at ACM SIGMETRICS 2025.

❹ – Teaching Assistant At the UMass Amherst, I supported *Algorithms for Computer Engineering* and *Systems Programming*, guiding students through algorithm analysis, Unix-based software engineering, and iterative system design. At the National University of Computer and Emerging Sciences in Pakistan, I was a TA for *Advanced Embedded Systems*, where I helped students master embedded systems concepts, rapid prototyping, and PCB design.

References

[1] *Association for the Advancement of Sustainability in Higher Education (AASHE) Conference & Expo*. https://www.aashe.org/conference/. 2024.

[2] *UMass Turing Summer Program*. https://lass.cs.umass.edu/turing/. 2024.