Teaching Statement

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Teaching Philosophy

My teaching philosophy is shaped by a continuum of formative experiences—from inspiring school teachers to the many mentors who guided me through my undergraduate, Master's, PhD, and postdoctoral studies. These experiences taught me that although the position I am applying for is titled "Assistant Professor", its core responsibility is deeply human: *to spend meaningful time with students, understand their strengths and weaknesses, and guide them through a creative, rigorous, and practical learning process.*

I view teaching and research as mutually reinforcing. Teaching reveals conceptual gaps, strengthens clarity of thought, and inspires curiosity, while research brings freshness, relevance, and real-world grounding into the classroom. My goal is to blur the boundary between these two activities, making learning inquiry-driven and connected to ongoing challenges in networking and systems.

A key part of my philosophy stems from my cross-disciplinary academic path: undergraduate and Master's training in Electrical & Computer Engineering (ECE) followed by a PhD and postdoctoral work in Computer Science (CS). ECE students often excel in physical intuition and analytical reasoning, while CS students gravitate toward abstractions, implementation, and system building. Networking lies precisely at this intersection, and these differing mindsets can create an educational gap.

Having navigated both worlds closely, I see it as part of my mission to bridge this gap. I strive to design learning experiences that combine the analytical rigor of ECE with the system-level creativity of CS, helping students appreciate networks not merely as protocols or circuits but as interconnected physical–algorithmic systems. Cultivating this balanced perspective is essential as networking evolves to support AI, optical technologies, and cloud-scale infrastructures.

Ultimately, I see teaching not merely as a professional responsibility but as a privilege—an opportunity to shape how students think, question, design, and discover. My long-term aim is to foster students who are technically strong, intellectually curious, and confident in exploring interdisciplinary ideas. Through teaching, mentorship, and collaboration, I hope to contribute meaningfully to an institution's academic mission and to the growth of the next generation of networking researchers and engineers.

Teaching Plan

I aim to design courses that bring together the analytical grounding of ECE and the systems perspective of CS. Alongside conventional Computer Networks courses (which I am happy to teach), I propose the following senior undergraduate and graduate courses for both ECE and CS Depts.

Optical Networks. Given the increasing relevance of optics from long-haul internet backbone networks to modern datacenters, I am eager to offer a comprehensive course on optical networks. The course would cover fundamentals of optical transmission and hardware (relevant to network design), optical switching technologies and device models, network primitives they can support, abstractions used in designing data/control plane architectures, and finally algorithmic/system-level design challenges in classical Telecom environments (backbone, metro, access) and ML-driven datacenter networks. Such a diversity would help the students to gain a cohesive hardware–architecture–systems understanding. Moreover, I could fully leverage my ECE + CS background and active research experience while designing the course.

Network Modeling and Simulation. This proposed course bridges theory and practice by exploring a focused set of foundational topics such as random-access protocols, queueing dynamics in network switches, routing behavior, congestion control, and scheduling algorithms etc., through analytical modeling, simulation, and

controlled experimentation. Students will validate theoretical predictions, build intuition, and understand the interplay between system behavior and models. This depth-first approach would complement the breadth & protocol heavy approach of traditional Computer Networks course and would prepare students for systems-oriented industry roles as well as research careers.

Seminar in Networking. I would also be interested in conducting seminar-style courses in networking, where students engage with foundational and modern research papers, present them, participate in discussions, and possibly conduct small exploratory projects. This format has proven immensely effective in building research taste, confidence, and technical communication skills.

Teaching Experience

My earliest teaching experiences began during my Master's at IIT Kharagpur, where I served as a TA for two strong courses—*Modern Digital Communication Techniques* and *Optical Networks*. These courses blended mathematical reasoning, hardware intuition, and system design. I delivered short lectures and led discussions to help students navigate challenging conceptual topics. These experiences strengthened my ability to explain complex ideas and motivated me to pursue a PhD, and eventually, an academic career.

During my PhD at Rice University, I was a TA multiple times for the *Computer Networks* course. I regularly held office hours, clarified conceptual doubts, and assisted students with programming assignments and course projects. I also delivered example lectures for *Advanced Networking Seminar* course multiple times. My responsibility was to demonstrate how to present a research paper in a classroom setting—contextualizing the background, highlighting core contributions, objectively discussing limitations, and suggesting future directions. Many students later shared that these sessions significantly helped them develop confidence in reading and presenting research papers.

During my Postdoc at ETH Zurich, I co-organized and co-taught a semester-long *Seminar in Computer Networks* with two other postdocs, where we curated themes, selected foundational papers, and mentored student presenters. I am also scheduled to deliver a lecture in the *Advanced Networking* course titled "Networking for ML: The Optics Chapter", integrating my ECE background in optical hardware with my CS training in systems/datacenters—I aim to bring such cross-disciplinary framing to my future classroom.

Collaboration and Mentoring Experience

During my PhD, I collaborated closely with fellow lab members and faculty such as Prof. Arlei Silva and Prof. Ang Chen, leading to several top-tier publications. My internship at Accenture Labs, mentored by Dr. Sanjoy Paul and in collaboration with Rutgers University (WINLAB), broadened my interdisciplinary outlook and strengthened my ability to translate theoretical insights into practical system design. During my current postdoc, I am collaborating with Dr. Paolo Costa (Microsoft Cambridge).

As a postdoctoral researcher at ETH Zurich, I am actively mentoring three amazing PhD students: Lukas Röllin is working on optical networks and sustainability, Valerio Torsiello is working on distributed AI systems, Pietro Ronchetti is working LEO satellite networks. I am also mentoring Sreelekshmi Suresh, another PhD student in India; she is working on hybrid payment channel networks. Together, we have already submitted one full paper and are developing three more. I greatly enjoy this mentoring process: brainstorming unconventional ideas, converging on experimental designs, and helping in their writing. These interactions also enrich my own thinking; students often bring fresh perspectives that spark new research directions.