Teaching Statement

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Classroom Pedagogy

I have taught a graduate-level natural language processing (NLP) survey course at USC annually since 2017. While the syllabus has nominally remained the same, the content has undergone a radical transformation, mirroring the paradigm shifts in our field. My teaching philosophy centers on the belief that the primary function of graduate education is to enable autodidactic capability, in order to empower students to navigate a rapidly evolving field long after the semester ends.

In my early years teaching this course, the curriculum followed a traditional linguistic hierarchy: from data processing to syntax, semantics, and finally discourse. Today, that hierarchy has dissolved. Since Fall of 2024 I have inverted this structure, introducing Transformers and driving through fundamentals of language model pre- and post-training as the foundational grammar of modern NLP before exploring specific applications. This shift allows students to engage immediately with the tools driving current research while understanding the historical context that shapes their limitations. I have wrestled with the question of whether to remove even more of the applications, such as Information Extraction and Machine Translation, to make room for hot language model development topics, such as Mixture of Experts and speculative decoding. Surprisingly, however, I find that the students are more engaged by the former, wanting to understand how we break down core language task capability, so I have maintained this well-rounded balance, to both prepare students with the fundamentals they need when they seek internships and jobs at tech companies, as well as the insights to motivate their blue-sky research thinking. Crucially, I integrate the AIM pillar of Accessibility directly into this curriculum. I require students to stress-test their models against diverse user profiles, asking, via carefully crafted homework problems, whether state-of-the-art performance holds up for speakers of low-resource languages or users relying on assistive technologies.

Additionally, this year I have added an "NLP News" mini-lecture to each class, where I highlight stories in the popular press that touch on core NLP technology and its perception and real impact in the non-technical world. This was a fascinating semester to launch this innovation, as I never had fewer than three new stories per class (the class met twice a week), touching on subjects from revolutions in education, to massive multinational investments, to concerns about mental health effects. Students were very engaged by these discussions, as they saw the effect their research could have on society at large.

For PhD students, I de-emphasize rote recall in favor of communication and synthesis. Homework assignments involve reproducing core models, but the deliverables are structured as research papers. Students are graded not just on leaderboard performance but on their ability to articulate why a model behaves as it does. Drawing on my own research into the limitations of automated metrics, I train students to look beyond state-of-the-art scores and rigorously interrogate failure modes using human-grounded evaluation protocols. I also mandate a Socratic presentation style for paper reviews, where students must lead the class in interrogating a recent publication. This forces them to move beyond passive reading to active critique, and engages the entire class in the latest and greatest research findings emerging daily in this fast-moving field. We structure the presentation of these publications so they tie in with lecture material, ensuring students have a core technical background in a topic before they jump to the latest approaches.

For the final project, I eschew open-ended sandbox projects in favor of reproduction studies with a required "extra mile" component. Students must reproduce a recent conference paper and then extend it, by testing a new hypothesis, applying it to a new domain, or analyzing a failure mode. This structure mimics the actual scientific process: building on prior work to create new knowledge. Students consistently rate this approach highly (averaging 4.48/5 in instructor evaluations), citing it as the moment they transitioned from *students* to *researchers*. The National AI Research Resource (NAIRR) Pilot program was particularly taken with this approach as well, and they awarded my class 3900 hours of GPU compute time in 2025 to complete their projects.

Cognitive Alignment Seminar

At UMD, I am eager to introduce a new advanced seminar, tentatively titled "Decoding Thought: Language in Brains and Machines." This course will serve as the pedagogical bridge to my research on Cognitive Alignment, i.e.,

drawing connections between language models as they are formed in NLP and the way language is used in the brain. While such courses are often housed in Neuroscience or Psychology departments (e.g., UMD's LING 646), I will approach them from a computer science perspective. We will explore the degree to which the representation of language in today's computational models can be mapped to regions of activity in the brain and vice versa. The course curriculum will cover fundamentals of language models and brain imaging techniques, and will then focus on recent research that explores the degree to which computational models can serve as proxies for human cognitive processes, how neuronal data can inform future model architecture, and how we can detect language usage via imaging, with applications toward developing assistive technologies.

This seminar will use a *role-playing* format, where students analyze a single paper from multiple distinct perspectives (e.g., the **Archaeologist** who contextualizes the work, the **Hacker** who scrutinizes the code/data, and the **Ethicist** who challenges the societal implications). This format is designed to prepare AIM students for the interdisciplinary reality of modern AI research, where they must fluently speak the languages of biology, ethics, and engineering simultaneously.

Beyond graduate supervision, I am eager to support AIM's mission of cross-campus education. I would welcome the opportunity to co-teach an undergraduate "AI and Society" course tailored for non-CS majors in Journalism or Public Policy, ensuring that the next generation of civic leaders understands both the mechanics and the limits of the models shaping our world.

Mentoring and Research Leadership

My mentoring philosophy is grounded in the recognition that research is a social and communicative act, not just a technical one. I have supervised seven graduated PhD students and am currently advising eight more, alongside numerous MS students. My alumni have gone on to positions at industry labs such as Microsoft and Amazon, academia (King Abdulaziz University, Stanford, University of Minnesota), and startups, demonstrating the effectiveness of this approach.

My goal is to identify a student's natural strengths and use those as leverage points to improve their weaker areas. For example, a student with strong coding skills but weak narrative ability will be encouraged to write a draft of their paper before they begin coding or run experiments, to ensure there is a strong story motivating the research.

Given my research focus on bias and cross-cultural communication, I am deeply committed to building diverse research teams. I actively recruit students who can bring community-grounded perspectives to our work. At AIM, I intend to co-advise students across departments (e.g., Computer Science and Journalism/Public Policy), fostering a lab culture where a wildly audacious idea from a linguist can be rigorously engineered by a computer scientist. I view teaching and mentorship not as separate from my research, but as the engine that sustains it. I look forward to bringing this rigorous, research-aligned pedagogy to the students at UMD.