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Artificial Intelligence Initiative (Aii)

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Invited Speaker

Mr. Shashank Sonkar, Rice University



“Pedagogy Meets AI: Challenges and Innovations in LLM-Powered Learning”

Thursday, May 8, 2025 • 11:00AM • R1 101 • Zoom

Abstract:
The rapid advancement of artificial intelligence, particularly large language models, is fundamentally reshaping how we learn and interact with knowledge, offering unprecedented opportunities to develop intelligent systems that enhance human learning at scale. However, realizing this potential requires addressing core technical challenges: optimizing LLMs for pedagogically sound instruction, developing robust computational models to track learners' misconceptions grounded in counterfactual reasoning, and designing scalable approaches for nuanced, actionable feedback on long free-form student responses. My talk will focus on how my research addresses these challenges by (1) pedagogical alignment of large language models (LLMs), (2) cognitive modeling of student thinking via LLMs trained to reason about students' counterfactual rationales, and (3) advancing LLM-based grading of very long open-ended responses. By integrating insights from natural language processing and learning sciences, this work aims to create more effective, scalable, and pedagogically grounded LLM-enhanced educational technologies.

Bio:
Shashank Sonkar is a Ph.D. candidate in the Department of Electrical and Computer Engineering at Rice University, advised by Richard Baraniuk, specializing in Natural Language Processing for personalized education. His research focuses on three critical aspects of AI-powered education: pedagogical alignment of large language models, advanced learner modeling, and intelligent assessment. These areas correspond to three key factors that determine educational learning outcomes: instructional approach, learner understanding, and assessment quality. He has collaborated extensively with OpenStax Research, a leading nonprofit organization that develops free, high-quality, openly licensed educational resources, and is a key member of SafeInsights, a large-scale privacy-preserving education research hub led by OpenStax at Rice University.