



Department of Industrial &
Systems Engineering
Cullen College of Engineering

ISE FRIDAY SEMINAR

BROADEN HORIZONS EXTEND MINDS



Professor Shuai Huang

Department of ISE

The University of Washington

Seattle, WA

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Time: 1 - 1:50 pm

Location: D2 Lect2

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ALARM & CrowdLLM: Streamline LLMs for Quality Decision-Making

Abstract: Large language models (LLMs) have demonstrated unprecedented capabilities in understanding and reasoning across complex tasks. They offer the potential to build cost-effective, accurate, and reliable AI systems that assist humans in processing massive amounts of information and making timely, high-quality decisions. For example, LLM-based systems can enable smart-home monitoring by detecting anomalies from real-time surveillance video and recommending preventive actions. However, significant challenges remain in streamlining LLMs for robust and trustworthy decision-making, as they are often prone to uncertainty, bias, and limited diversity in their outcomes. In this talk, we introduce two frameworks designed to address these challenges: ALARM, an LLM-based anomaly detection system with integrated uncertainty quantification, and CrowdLLM, a framework that combines LLMs with generative models to create a “digital population” serving as a cost-effective digital twin for applications such as crowdsourcing, social simulation, and recommendation systems. We conclude with a discussion of future directions toward dependable and interpretable LLM-based decision systems.

Short Bio: Dr. Shuai Huang is a Professor of Industrial & Systems Engineering at the University of Washington. He received a B.S. degree on Statistics from the School of Gifted Young at the University of Science and Technology of China in 2007 and a Ph.D. degree on Industrial Engineering from the Arizona State University in 2012. His research focuses on data analytics and AI problems in healthcare and engineering applications. His research has been funded by NSF, NIH, DARPA, AHRQ, Breakthrough T1D (formerly known as JDRF), DOT, Meta, Amazon, and several other research institutes and foundations. He was recipient of the Teaching Award (2023) and Professional Development Award (2023) from the Data Analytics and Information Systems division at IISE, Best AE Award (2024-2025) from IISE Transactions in Healthcare Systems Engineering, and best paper awards from INFORMS, IISE Transactions, and IEEE Transactions on Automation Science and Engineering. Dr. Huang currently serves as Associate Editor for the IISE Transactions in Healthcare Systems Engineering and INFORMS Journal of Data Science.

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