

One Fully-Funded Ph.D. Position

MINDxAI Lab, Industrial and Systems Engineering, University of Louisville

Position: Ph.D. Student

Start Date: Spring, Summer, or Fall 2027

The **Modeling Interaction, cogNition, and Decision-making by AI (MINDxAI) Lab** at the University of Louisville is expanding and will offer **one fully funded Ph.D. position** in the Department of Industrial and Systems Engineering. The selected student will work under the supervision of **Dr. Yunmei Liu**.

The MINDxAI Lab conducts interdisciplinary research at the intersection of human factors, systems engineering, human-centered AI, and adaptive intelligent systems. A central goal of our research is to understand how human cognitive, emotional, physiological, and behavioral states evolve during interactions with complex systems, and how this knowledge can inform the design of intelligent systems that adapt to human needs in real time.

The doctoral student will have opportunities to conduct research in areas such as adaptive system design, multimodal human-state estimation, human-AI/autonomy interaction, and immersive virtual reality (VR) and simulation-based experimentation. Depending on the student's interests and background, research may involve developing computational models of human states and behavior, investigating human responses to intelligent or automated systems, designing adaptive intervention strategies, and experimentally evaluating human-system interaction.

VR, simulation, AI/ML, and multimodal sensing serve as important research tools and experimental platforms within the lab. Students may use or extend immersive and simulation environments to investigate fundamental and applied questions in human-centered intelligent systems rather than focusing solely on software or algorithm development.

Current lab projects span transportation, manufacturing, rehabilitation, healthcare, aviation, and other safety-critical human-system domains, with extensive cross-domain and cross-institutional collaborations. Please see our ongoing research projects here: <https://mindxai-lab.github.io/Research.html>

We particularly welcome students who combine strong research curiosity with a solid technical foundation and who are interested in using computational and experimental methods to study and design human-centered intelligent systems.

Qualifications:

1. A Bachelor's degree or, preferably, a Master's degree in Industrial and Systems Engineering, Human Factors, Biomedical Engineering, Mechanical Engineering, Electrical and Computer Engineering, Computer Science, Robotics, or a closely related field.
2. Strong research interest in one or more of the following areas:
 - Human-centered AI and human-AI/autonomy interaction;
 - Adaptive systems and adaptive automation;
 - Multimodal human-state or behavioral modeling;
 - Virtual reality, immersive systems, or simulation-based human-subject research;
 - Human factors and human-systems integration.
3. A strong quantitative and technical foundation. Experience with AI/ML, statistical modeling, physiological or behavioral data analysis, VR/simulation, or intelligent-system development is highly desirable.

4. Prior research experience, such as a thesis, research assistantship, peer-reviewed publication, independent research project, or substantial research-oriented course project, is highly valued.
5. Strong analytical thinking, scientific writing, and English communication skills, together with the motivation to conduct interdisciplinary doctoral research.

Interested candidates are encouraged to contact **Dr. Yunmei Liu** at yunmei.liu@louisville.edu. Please use the subject line: **"2027 PhD position: [Your Name]"** and include your **CV and transcripts** in the email. Applicants are also encouraged to briefly describe their research interests, previous research experience, and technical background.

About Dr. Yunmei Liu and Team: <https://mindxai-lab.github.io/Team.html>

About the MINDxAI Lab: <https://mindxai-lab.github.io/>

The lab currently occupies three research spaces: Henry Vogt Building Room 312 and J.B. Speed Building LL13 and LL14, with approximately 600 square feet of dedicated laboratory space in total. The lab is equipped with state-of-the-art facilities supporting research in **human-centered AI, adaptive systems, multimodal human-state measurement, and immersive experimentation**, including a driving simulator, EmotiBit sensors, eye-tracking systems, EEG headsets, and Delsys electromyography sensors. These facilities enable integrated studies of human cognition, behavior, physiology, and interaction with intelligent systems. To support computational modeling and large-scale multimodal data analysis, the lab also maintains substantial high-performance computing resources, including **four B200 GPUs, 20 active CPUs (with an additional 180 in queue), and 4 TB of dedicated storage**.

About the Department: The Department of Industrial and Systems Engineering is within the Speed School of Engineering located on the Belknap campus. The department has been a degree granting department since the late 1970s. The department has 13 faculty with the following research thrusts: operations research and decision analytics, human factors and ergonomics, advanced manufacturing, and engineering education. Faculty research has been supported by a variety of federal grants and industry contracts (e.g., NSF, DoD, ONR, NIST, NASA, FHWA, Toyota, GE Appliances/Haier).