Presents:

Dr. Abby Wooldridge
Assistant Professor, Dept. Of Industrial & Enterprise Systems Engineering
The Grainger College of Engineering, University of Illinois Urbana-Champaign

“Modeling Interactions in Complex Health Care Sociotechnical Systems: Challenges and Opportunities for Improving Pediatric Patient Safety”

Abstract: Health care sociotechnical systems are complex and adaptive, as their outcomes depend on interactions between and within system components; understanding these interactions is crucial to improving outcomes such as patient safety, health equity and outcomes of health care professionals. My human factors research addresses the challenge of how these interactions emerge dynamically over time. I empirically and systematically explore these interactions with the goal to improve system performance, e.g., patient safety in care transitions and pediatric resuscitations. In this presentation, I will describe my research developing mixed methods approaches to quantify qualitative data and model interactions in health care complex sociotechnical systems. In the first case, my aim is to improve communication between clinicians who exchange information, authority and responsibility during handoffs of pediatric patients from operating rooms (ORs) to pediatric intensive care units (PICUs) to avoid lost, incomplete or incorrect information, which ultimately can contribute to patient harm. I model team cognition in communication between care team members, using the new approach of Epistemic Network Analysis. In the second case, we use an augmented reality application to educate clinicians about standardized pediatric code cart contents – accurate knowledge of which is critical for rapid, safe resuscitation efforts for hospitalized children. Building on an analysis of work system barriers and facilitators that impact the use of the application by clinicians, I model interactions between barriers and facilitators, and find instances where barriers or facilitators can amplify net negative or positive impact, respectively. I also find how facilitators can exacerbate barriers, worsening negative impact to clinician use of the application. Collectively, these cases showcase my use of the novel Epistemic Network Analysis methodology to enhance my efforts to model system interactions in the complex sociotechnical systems involved in the care of vulnerable patients, such as children. My research develops innovative approaches to sociotechnical systems modeling, filling gaps in the foundational knowledge and methodologies of human factors and ergonomics to support teams in health care delivery and address pervasive and persistent problems of health inequity and patient safety.

Biography: Abigail R. Wooldridge is an Assistant Professor in the Department of Industrial and Enterprise Systems Engineering, where she directs the Human Factors in Sociotechnical Systems Laboratory. Her research focuses on engineering sociotechnical systems to support teams and improve equity and justice, particularly in health care and health-related settings. She has courtesy appointments in Computer Science, Kinesiology and Community Health, School of Information Sciences, Beckman Institute for Advanced Science and Technology, Coordinated Science Laboratory and Biomedical and Translational Sciences at Carle Illinois College of Medicine. Dr. Wooldridge received her PhD from the University of Wisconsin-Madison focused on Human Factors and Ergonomics; she also has worked in industry, with experience in process improvement consulting, decision support and surgical scheduling. Her work appears in Ergonomics, Applied Ergonomics, Cognition, Technology and Work, Applied Clinical Informatics, Internal and Emergency Medicine, Health Affairs, PLOS One and more. Her edited volume, Advancing Diversity, Inclusion, and Social Justice Through Human Systems Engineering, received the Choice Outstanding Academic Title 2020 Award. She recently was awarded the Presidential Medallion from University of Illinois System President Tim Killeen and the inaugural Robert L. Wears Early Career Award by the Health Care Technical Group of the Human Factors and Ergonomics Society.

Friday, 1/14/2022, 12:00 pm
Room 1163 ME