TECHNISCHE UNIVERSITÄT CHEMNITZ

Joint Institute Colloquium Psychology and Systems & Control Seminar

06.02.2026 at 14:00, online

Prof. Cleotilde Gonzalez

Department of Social and Decision Sciences at Carnegie Mellon University

Designing Complementary Intelligence: Cognitive Foundations for Human–AI Teaming

The next frontier in AI is not about building more powerful models; it is about creating complementary intelligence between humans and machines. This talk explores how insights from cognitive science can guide the design of AI systems that enhance rather than replace human decision-making. I will introduce the concept of Cognitive AI, which models core human cognitive processes such as learning and decision making, and contrast it with the large-scale optimization focus of Machine AI. I will describe how these paradigms can be integrated to support effective human–AI teaming. Through mechanisms of shared representations, bidirectional goal translation, human-guided training, and coevolution, we can build AI that aligns with human preferences, supports human judgment under uncertainty, and enables adaptive collaboration in dynamic environments. I will provide an overview of a few examples of Cognitive AI systems that illustrate the interaction between Cognitive and Machine AI.

About the speaker: Cleotilde (Coty) Gonzalez is a Research Professor at the Department of Social and Decision Sciences at Carnegie Mellon University. Her research focuses on human decision-making in dynamic, complex environments. She is the founding director of the Dynamic Decision Making Laboratory, where researchers conduct behavioral studies on dynamic decision-making using Decision Making Games, and create technologies and cognitive computational models to support decision-making and training. She is also the research Co-Director of the NSF National AI Institute for Societal Decision-Making (AISDM), which aims to augment human decision-making in societal problems such as public health and disaster management. In addition, Coty is affiliated with the CyLab Security and Privacy Institute, the HCII Human-Computer Interaction Institute, and the Software and Societal Systems Department at Carnegie Mellon University. She is a 2024 AAAS Fellow, a lifetime fellow of the Cognitive Science Society and of the Human Factors and Ergonomics Society. She is a Senior Editor for Topics in Cognitive Science, a Consulting Editor for Decision, and an Associate Editor for the System Dynamics Review. She has published hundreds of papers in journals and peer-reviewed proceedings across diverse fields stemming from her contributions to Cognitive Science. Her work includes the development of a theory of decisions from experience called Instance-Based Learning Theory (IBLT), from which many computational models have emerged in areas as diverse as cybersecurity, network science, human-machine teaming, and others.

Time Friday, February 6, 2026, 14:00

Place https://eu02web.zoom-x.de/j/65589339782 (Meeting ID: 655 8933 9782)

Professur Allgemeine Psychologie und Human Factors
Prof. Dr. Stefan Brandenburg
www.mytuc.org/lcxy

Professur Regelungstechnik & Systemdynamik
Prof. Dr.-Ing. habil. Stefan Streif
www.tu-chemnitz.de/etit/control