

ABSTRACT

This talk on neurosymbolic visual commonsense addresses computational cognitive vision at the interface of language, logic, cognition, and artificial intelligence. Broadly, the talk will present recent efforts in “Hybrid AI” aimed at the integration of methods from knowledge representation & reasoning and deep learning driven computer vision with a focus on (combining) reasoning & learning about space, motion, and embodied multimodal interaction. In particular, systematically formalised declarative neurosymbolic explainability supporting capabilities such as semantic (visual) question-answering, relational learning, non-monotonic (visuospatial) abduction, and commonsense simulation of embodied interaction will be demonstrated. Such capabilities will be presented in the backdrop of areas as diverse as autonomous driving, cognitive robotics / HRI, and AI for empirical/behavioural research in vision science, and humanities-centred media studies. Covering “in-the-wild” case-studies showcasing capabilities such as explainable visual perception, semantic video understanding, explainable language generation from video etc, I will position an outward looking and multi-faceted account of computational cognitive vision at the confluence of artificial and human intelligence, bringing together research methodologies encompassing Commonsense Reasoning, Vision, ML, and Spatial Cognition and Computation.

ABOUT THE SPEAKER

Mehul Bhatt is Professor within the School of Science and Technology at Örebro University (Sweden). His basic research focusses on the formal, cognitive, and computational foundations for AI technologies with a principal emphasis on knowledge representation, semantics, integration of commonsense reasoning & learning, explainability, spatial representation and reasoning, and visual perception. His research in AI and Spatial Cognition particularly emphasises the study of human-behaviour (embodied multimodal interaction) in naturalistic settings as a principal means of AI technology driven human-centred cognitive assistance in planning, decision-making, design situations requiring an interplay of commonsense, creative, and specialist visuospatial thinking. Mehul Bhatt steers CoDesign Lab EU (codesign-lab.org), an initiative aimed at addressing the confluence of Artificial and Human Intelligence for the development of human-centred cognitive assistive technologies and interaction systems. He directs the research and consulting group DesignSpace (design-space.org), and has pursued ongoing research in (computational) Cognitive Vision and (human) Visual Perception, and Declarative Spatial Reasoning.

Mehul Bhatt obtained a bachelors in economics (India), masters in information technology (Australia), and a PhD in computer science (Australia). He has been a recipient of an Alexander von Humboldt Fellowship, a German Academic Exchange Service award (DAAD), and an Australian Postgraduate Award (APA). He was the University of Bremen nominee for the German Research Foundation (DFG) Award: Heinz Maier-Leibnitz-Preis 2014. Previously, Mehul Bhatt was Professor at the University of Bremen (Germany).