

# MINDS. MOVEMENT. MOVING IMAGE.

SYMPOSIUM I / SPATIAL COGNITION AND THE BUILT ENVIRONMENT

SYMPOSIUM II / VISUO-AUDITORY PERCEPTION AND THE MOVING IMAGE

Convener

Mehul Bhatt / University of Bremen, and Örebro University

# ABOUT THE SYMPOSIA

## ABOUT THE SYMPOSIA

This symposium -conducted in two parts - explores the confluence of empirically-based qualitative research in the cognitive and psychological sciences, focusing on visual and spatial cognition, with computationally-driven analytical methods, rooted in artificial intelligence, in the service of communications, media, design, and human behavioural studies. With a focus on architecture and visuo-auditory media design, the twin symposia will demonstrate recent results and explore the synergy of research methods for the study of human behaviour in the chosen (design) contexts of socio-cultural, and socio-technological significance.

The symposium brings together experts and addresses methods and perspectives from:

- Visuo-Spatial Cognition and Computation
- Artificial Intelligence
- Cognitive Systems
- Cognitive Science and Psychology
- Design Cognition and Computation
- Multimodality and Interaction
- Neuroscience
- Communications and Media Studies
- Architecture, Built Environment
- Design Studies (focus on architecture and visuo-auditory media)
- Evidence Based Design

The symposium particularly emphasis the role of multimodality and mediated interaction for the analysis and design of human-centred, embodied, cognitive user experiences in everyday life and work. Here, the focus is on multimodality studies aimed at the semantic interpretation of human behaviour, and the empirically-driven synthesis of embodied interactive experiences in real world settings. In focus are narrative media design, architecture and built environment design, product design, cognitive media studies (film, animation, VR, sound and music design), and user interaction studies. In these contexts, the symposium emphasises evidence-based multimodality studies from the viewpoints of visual (e.g., attention and recipient effects), visuo-locomotive (e.g., movement, wayfinding), and visuo-auditory (e.g., narrative media) cognitive experiences. Modalities being investigated include, but are not limited to:

- visual attention (by eye-tracking), gesture, speech, language, facial expressions, tactile interactions, olfaction, biosignals
- human expert guided event segmentation  
(e.g. coming from behavioural or environmental psychologists, designers, annotators, crowd-sensing)
- deep analysis based on dialogic components, think-aloud protocols.

The scientific agenda of the twin-symposia also emphasises the multi-modality of the embodied visuo-spatial thinking involved in "problem-solving" for the design of objects, artefacts, and interactive people-experiences emanating therefrom. Universality and inclusion in "design thinking" are of overarching focus in all design contexts relevant to the symposium; here, the implications of multimodality studies for inclusive design, e.g., creation of presentations of the same content in different modalities, are also of interest. The symposium provides a platform to discuss the development of next generation embodied interaction design systems, practices, and (human-centred) assistive frameworks and technologies encompassing the multi-faceted nature of embodied design conception and synthesis. Individual contributions / talks within the two symposia address the themes under consideration from formal, computational, cognitive, design, engineering, empirical, and philosophical perspectives.

**SYMPOSIUM I** / Spatial Cognition and the Built Environment / Six Panelists, addressing:

// How can cognitive modalities constitute the foundational building blocks of design education, discourse, systems & assistive technologies, and the professional practice of spatial design for architecture? //

**SYMPOSIUM II** / Visuo-Auditory Perception and the Moving Image / Six Panelists, addressing:

// What are the visual-auditory cues that drive attention? How can research in visuospatial cognition influence the design of digital media? What kinds of paradigm shifting multimodal media platforms seem likely to emerge in the future, and how can the cognitive and psychological sciences serve a guiding role towards this? //

### SYMPOSIA SPEAKERS

- Prof. Mehul Bhatt  
University of Bremen, and Örebro University, Sweden – Germany
- Prof. Ann Sloan Devlin  
Connecticut College, United States
- Prof. Kay O'Halloran  
Curtin University, Australia
- Dr. Paul Hemeren  
University of Skövde, Sweden
- Prof. Lissa Holloway-Attaway  
University of Skövde, Sweden
- Vasiliki Kondyli  
University of Bremen, Germany
- Dr. Juhyun Lee  
University of South Australia, Australia
- Prof. Daniel Levin  
Vanderbilt University, United States
- Prof. Juval Portugali  
Tel-Aviv University, Israel
- Jakob Suchan  
University of Bremen, Germany
- Prof. Barbara Tversky  
Stanford University & Columbia University, United States

# SYMPOSIA PROGRAMME

## SYMPOSIUM I

### MINDS. MOVEMENT. MOVING IMAGE.

#### On Spatial Cognition and the Built Environment

// How can cognitive modalities constitute the foundational building blocks of design education, discourse, systems & assistive technologies, and the professional practice of spatial design for architecture? //

- Embodied Architecture Design: On People-Centred Design of Visuo-Locomotive Cognitive Experiences  
**Prof. Mehul Bhatt**  
Örebro University, and University of Bremen  
Sweden, and Germany / <http://www.mehulbhatt.org>
- Healthcare Environments and Evidence-Based Design: The Missing Role of Spatial Cognition  
**Prof. Ann Sloan Devlin**  
Connecticut College  
United States / <https://www.conncoll.edu/directories/faculty-profiles/ann-s-devlin/>
- Precedent-Based Parametric Design: Computationally Generated Spatial Morphologies Satisfying Behavioural-Based Design Constraints  
**Vasiliki Kondyli**  
University of Bremen  
Germany / <http://www.design-space.org>
- Multi-Cultural Design Communication: Cognition, Design Information, and Spatial Language  
**Dr. Juhyun Lee**  
University of South Australia  
Australia / <https://www.newcastle.edu.au/profile/juhyun-lee>
- On the relations between cognitive maps and images of cities  
**Prof. Juval Portugali**  
Tel-Aviv University  
Israel / [www.tau.ac.il/~juval/](http://www.tau.ac.il/~juval/)
- Cross-Cultural Differences in Visualizations  
**Prof. Barbara Tversky**  
Stanford University, and Columbia University  
United States / [www-psych.stanford.edu/~bt/](http://www-psych.stanford.edu/~bt/) | <http://datascience.columbia.edu/barbara-tversky>

## SYMPOSIUM II

### MINDS. MOVEMENT. MOVING IMAGE.

#### On Visuo-Auditory Perception and the Moving Image

//What are the visual-auditory cues that drive attention? How can research in visuospatial cognition influence the design of digital media? What kinds of paradigm shifting multimodal media platforms seem likely to emerge in the future, and how can the cognitive and psychological sciences serve a guiding role towards this? //

- Cognitive Media Studies: Potentials for Spatial Cognition and AI Research  
Prof. Mehul Bhatt  
University of Bremen, and Örebro University  
Germany, and Sweden / <http://www.mehulbhatt.org>
- Multimodal Rhetoric in Online Media Communications  
Prof. Kay O'Halloran  
Curtin University  
Australia / <https://staffportal.curtin.edu.au/staff/profile/view/KayOhalloran>
- Actions, intentions and environmental constraints biological motion perception  
Dr. Paul Hemeren  
University of Skövde  
Sweden / [http://www.his.se/en/about-us/Facts-and-figures/staff/paul\\_hemeren/](http://www.his.se/en/about-us/Facts-and-figures/staff/paul_hemeren/)
- Designing Game-based Narratives and Interactive Worlds for Cultural Engagement  
Prof. Lissa Holloway-Attaway  
University of Skövde  
Sweden / [http://www.his.se/en/about-us/Facts-and-figures/staff/lissa\\_hollowayattaway](http://www.his.se/en/about-us/Facts-and-figures/staff/lissa_hollowayattaway)
- How People Represent Space and Events While Viewing Cinema  
Prof. Daniel Levin  
Vanderbilt University  
United States / <https://my.vanderbilt.edu/daniellevinlab>
- Machine Coding of Narrative Structures in Visuo-Spatial Imagery  
Jakob Suchan  
University of Bremen  
Germany / <http://www.cognitive-vision.org>

# SYMPOSIUM ORGANISATION



# DesignSpace

## THE DESIGNSPACE GROUP

DesignSpace is a research and consultation group focussing on the development of cognitive technologies and educational discourse for people-centered spatial thinking and architecture design. DesignSpace research has developed cognitive assistive technologies for people-centred usability analysis and building performance evaluation at all phases of the architecture design process, including design conception, preliminary prototyping & iterative refinement, and evidence-based post-occupancy analysis with a specific focus on wayfinding, signage, and eye-tracking studies.

DesignSpace offers a range of solutions for the universal design paradigm guided execution of large-scale built-up environments; the team has a track-record in providing customised technological solutions for the healthcare and aviation sectors. DesignSpace also conducts case-study driven intensive seminars and accredited training workshops both in academic / non-profit as well as private contexts.

If you would like to obtain more information, or get involved, please send us an email at: [info@design-space.org](mailto:info@design-space.org)

[www.design-space.org](http://www.design-space.org)

# Cognitive Vision

## COGNITIVE VISION

The Cognitive Vision research project addresses computational cognitive vision and human visual perception from the viewpoints of cognition, language, logic, and artificial intelligence. Currently, our emphasis is on the integration of vision and artificial intelligence from the viewpoints of perception, interaction, and control focusing on themes such as: Commonsense Scene Understanding, Explainable Visual Interpretation, Concept Learning and Inference from Visual Stimuli, Semantic Question-Answering with Image and Video, Visuo-Spatial Representation Learning, Visual Perception (e.g., involving eye-tracking), Embodied (Multimodal) Event Perception.

Basic research is driven by application areas where, for instance, the processing and deep semantic interpretation of (potentially large volumes of) highly dynamic visuo-spatial imagery is central.

If you would like to obtain more information, or get involved, please send us an email at: [info@cognitive-vision.org](mailto:info@cognitive-vision.org)

[www.cognitive-vision.org](http://www.cognitive-vision.org)

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