Biannual Conference, Tübingen, Germany
September 05-08, 2018
Wednesday, September 5

08:30 – 12:30 MORNING SESSIONS
with Coffee Break 10:30 – 11:00

WORKSHOP 1
Spatial Cognition and Artificial Intelligence
Maria Vasardani & Kai-Florian Richter

TUTORIAL 2
Spatial Navigation Interfaces for Immersive Environments
Bernhard Riecke & Ernst Kruijff

SYMPOSIUM 3
Connecting Spatial Visualization Skills and STEM
Sheryl Sorby & Gavin Duffy

12:30 – 14:00 Lunch Break

14:00 – 18:30 AFTERNOON SESSIONS
with Coffee Break 15:30 – 16:00

WORKSHOP 4
Models and Representations in Spatial Cognition
Tyler Thrash, John Kelleher & Simon Dobnik

WORKSHOP 5
Virtual environments as geo/spatial labs
Arzu Çöltekin, Victor Schinazi, Jan Wiener, Ismini-Eleni Lokka & Jiayan Zhao

Dinner: Birds of a Feather (watch for announcements)
**Thursday, September 6**

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<tr>
<th>Time</th>
<th>Session</th>
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<tr>
<td>9:00 – 9:15</td>
<td>Welcome &amp; Introduction</td>
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<tr>
<td>9:15 – 10:30</td>
<td>KEYNOTE 1</td>
<td>Psychological Distance – Similar Effects between Probability, Temporal, Spatial, and Social Distance &lt;br&gt; Nira Liberman, Tel Aviv &lt;br&gt; Chair: Sarah Creem – Regehr</td>
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<tr>
<td>10:30 – 11:00</td>
<td>Coffee Break</td>
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<tr>
<td><strong>NAVIGATING in SPACE I</strong></td>
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<tr>
<td>11:00 – 11:20</td>
<td>Spatial Features of Terrain Reflected in Pigeon Flights</td>
<td>Margarita Zaleshina &amp; Alexander Zaleshin</td>
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<tr>
<td>11:20 – 11:40</td>
<td>Humans Construct Survey Estimates on the Fly from a Compartmentalized Representation of the Navigated Environment</td>
<td>Tobias Meilinger, Agnes Henson, Jonathan Rebane, Heinrich H. Bülthoff &amp; Hanspeter A. Mallot</td>
</tr>
<tr>
<td>11:40 – 12:00</td>
<td>Spatial Survey Estimation is Incremental and Relies on Directed Memory Structures</td>
<td>Tobias Meilinger, Marianne Strickrodt &amp; Heinrich H. Bülthoff</td>
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<tr>
<td>12:00 – 12:20</td>
<td>Pointing Errors in Non-metric Virtual Environments</td>
<td>Alexander Muryy &amp; Andrew Glennerster</td>
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<tr>
<td>12:20 – 12:40</td>
<td>The Effect of Locomotion Modes on Spatial Memory and Learning in Large Immersive Virtual Environments</td>
<td>Xianshi Xie, Richard Paris, Timothy McNamara &amp; Bobby Bodenheimer</td>
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<tr>
<td>12:40 – 14:00</td>
<td>Lunch Break</td>
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</table>
Thursday, September 6

POSTER SESSION I: No. 1 – 30

14:00 – 14:30 Poster Preview

14:30 – 16:00 Poster Presentation and Coffee Break

P1.1 Xiaoli Chen, Paula Vieweg & Thomas Wolbers: Neural Coding of Landmark and Self-motion Cues in the Human Hippocampal-entorhinal System

P1.2 Tianyi Li, Angelo Arleo & Denis Sheynikhovich: Bidirectional Interactions between Place-Cells and Grid-Cells in the Vision- and Self-Motion Driven Spatial Representation Model

P1.3 Tristan Baumann, Gerrit A. Ecke & Hanspeter A. Mallot: Biologically Inspired View-Based Navigation with Place Fields Constituted Through “Micro-Snapshots”

P1.4 Radek Netusil, Tomas Pecka & Martin Vacha: Weak Radiofrequency Fields rather Cancel than only Modify the Magnetic Navigation of Insects

P1.5 Jennifer Sutton, Nicole Youngson & Chantelle Cocquyt: Cognitive Maps in the Real World and the Laboratory

P1.6 Eva Nuhn & Sabine Timpf: Does Interest Influence Landmark Selection?

P1.7 Gabriele Filomena & Judith A. Verstegen: Using Landmarks in Pedestrian Movement Simulation

P1.8 Charlotte Roy & Marc Ernst: Influence of Landmarks Permanency on Navigation

P1.9 Sascha Credé, Tyler Thrash & Sara Irina Fabrikant: The Effect of Concurrent Task Load on the Acquisition of Local and Global Landmark Knowledge

P1.10 Lace Padilla, Spencer Castro, Ian Ruginski, P. Samuel Quinan & Sarah Creem-Regehr: Evaluating Working Memory Demands in Visualization Decision Making

P1.11 Ketika Garg & Chris Kello: Foraging in Heterogeneous Environments

P1.12 Masashi Sugimoto, Noriko Nagata & Toru Ishikawa: Spatial Memory and Smartphone Use

P1.13 Török Zsolt Győző: Wayfinding and Navigation in a Virtual City

P1.14 Crystal Bae: Route Planning and Situated Navigation in a Collaborative Wayfinding Task
P1.15 Julia Frankenstein & Stefan Münzer: Navigation Behavior in Unknown Environments is Influenced by Background Knowledge about Urban Structures

P1.16 Ming Tang: Research on Scene Sketches Interpretation

P1.17 Daniel Ness & Min Wang: Reconceptualizing Affordance as a Cognitive Construct Dependent on Emergent Spatial Multi-Model Contexts

P1.18 Satoko Ohtsuka: Exploring Human Processing of 3D Perception with Using Compatibility Paradigm

P1.19 Lilian You Cheng, Mary Hegarty & Elizabeth Chrustil: Performance Discrepancy between Left-handers and Right-handers Reveals Multisensory Integration in the Mental Rotation of Hands

P1.20 Chuanxiuyue He & Mary Hegarty: Can Navigation Ability be Trained? Growth Mindset and Navigation Ability

P1.21 Adamantini Hatzipanayioti, Marcel Bechtold, Betty Mohler, Heinrich Buelthoff & Tobias Meilinger: Collaborative vs Individual Problem Solving

P1.22 Michele Scandola, Rossella Togni, Massimo Brambilla, Renato Avesani & Valentina Moro: On the Relation between Body and Movement Space Representation

P1.23 Gregory Peters-Founshtein, Tahel Nave, Liran Domachevsky, Amos Korczyn, David Groshar & Shahar Arzy: Illuminating Disorientation in Alzheimer’s Disease through the use of Functional, Structural and Metabolic Neuroimaging

P1.24 Christel Jacob, Constant Rainville, Alain Trognon, Reinhard Fescharek, Isabelle Clerc-Urmes & Thérèse Rivasseau Jonveaux: Is the Structuring Effect of Environment Elements on Route Learning Absolute or Relative?

P1.25 Asya Natapov: Semantics of Urban Space


P1.27 Alex Miklashevsky: Spatial Semantics of 16 Concrete and Abstract Categories

P1.28 Holger Schultheis & Jasper van de Ven: Preferences and Space in Everyday Activities

P1.29 Holger Schultheis & Tim Ziemer: An Auditory Display for Representing Two-dimensional Space

P1.30 Cristóbal Pagán Cánovas, Javier Valenzuela & Daniel Alcaraz Carrión: Spatial Cognition in Time Expressions
## TALKING ABOUT SPACE

**Chair:** Kai-Florian Richter

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<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speakers</th>
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<tbody>
<tr>
<td>16:00 – 16:20</td>
<td>A Graph Representation for Verbal Indoor Route Descriptions.</td>
<td>Stephan Winter, Ehsan Hamzei, Nico Van DeWeghe &amp; Kristien Ooms</td>
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<tr>
<td>16:20 – 16:40</td>
<td>Object Orientation in Dialogue.</td>
<td>Gesa Schole, Thora Tenbrink, Elena Andonova &amp; Kenny R. Coventry</td>
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<tr>
<td>16:40 – 17:00</td>
<td>Spatial Distribution of Local Landmarks in Route-based Sketch Maps.</td>
<td>Vanessa Joy Anacta, Rui Li, Heinrich Löwen, Marcelo Galvao &amp; Angela Schwering</td>
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<tr>
<td>17:00 – 17:20</td>
<td>The Influence of Animacy and Spatial Relation Complexity on the Choice of Frame of Reference.</td>
<td>Katarzyna Stoltmann, Susanne Fuchs &amp; Manfred Krifka</td>
</tr>
<tr>
<td>17:20 – 17:40</td>
<td>Applying Denis’s Framework in a Non-urban Context.</td>
<td>Ekaterina Egorova</td>
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### 18:00

**Excursion to Max Planck Institute**
(by registration only)
Thursday, September 6

EXCURSION TO MAX PLANCK INSTITUTE

18:00  Buses are leaving to the Max Planck Institute
18:30  Welcome & Snacks
19:30  Demo station I
20:00  Demo station II
20:30  Demo station III
21:15  Buses are returning to the main venue

Participation requires preregistration via the online survey. Registered participants will find a colored marker within their Welcome Bags which should be brought to the demonstrations. For late registration, please inquire at registration desk.

For directions to the bus stop, see the map on the last page of this program.
The TrackingLab allows physical walks through virtual space

The Cable Robot is used to examine the third dimension of space
Friday, September 7

9:00 – 10:15  KEYNOTE 2

There is no there there … or is there?
Luc Van Gool, Zürich

Chair: Heinrich H. Bülthoff

10:15 – 10:40  Coffee Break

AGENTS, ACTIONS, and SPACE

Chair: Ruth Dalton

10:40 – 11:00  Differences and Commonalities in Self-localization Accuracy of Humans and Robots.
Rul von Stülpnagel, Vincent Langenfeld & Christoph Hölscher

11:00 – 11:20  A Comparison of Mental and Physical Rotation using Gaze-based Measures.
Stefanie Wetzel & Sven Bertel

Nikhil Krishnaswamy & James Pustejovsky

11:40 – 12:00  Analyzing Strong Spatial Cognition.
Jasper van de Ven, Munehiro Fukuda, Holger Schultheis, Christian Freksa & Thomas Barkowsky
INDIVIDUALS in SPACE

Chair: David Uttal

12:10 – 12:30  Do Spatial Abilities Have an Impact on Route Learning in Hypertexts? Markus Kattenbeck, Thomas Jänich & Ludwig Kreuzpointner

12:30 – 12:50  A Dissociation Between Two Classes of Spatial Abilities in Elementary School Children. Cathleen Heil

12:50 – 13:10  State Anxiety Influences Sex Differences in Spatial Learning. Ian Ruginski, Jeanine Stefanucci & Sarah Creem-Regehr

13:10 – 14:15  Lunch Buffet

POSTER SESSION II

14:15 – 14:45  Poster Preview

14:45 – 16:15  Poster Presentation and Coffee Break

P2.1  Salome Pedrett, Rahel Tschachtli-Heiniger & Andrea Frick: Mental Rotation below Age 4 - Evidence from a new Mirror-Image Discrimination Task

P2.2  Steven Moore, Gary Scott, May Ling Halim, Adeline Wolfe & Mary Moore: Spatial Training, Computational Thinking and Math Performance in Elementary School Children

P2.3  Erica Barhorst-Cates, Cheryl Wright, Sarah Creem-Regehr, Jeanine Stefanucci & Elizabeth Cashdan: Movement and Art Experience, Spatial Abilities and Familiar Environment Representations in 9-10 Year Olds

P2.4  Agnieszka Kolodziej, Christophe Jouffrais & Valérie Tartas: Learning Space through Cooperation - a Study of Spatial Expressions by Sighted and Visually Impaired Children

P2.5  Helen Davis & Elizabeth Cashdan: Does a free-range Childhood Improve Spatial Cognitive Abilities?
Bob Kolvoord, Emily Grossnickle Peterson, David Uttal & Adam Green: Cognitive and Motivational Changes in Adolescents' Spatial Thinking

Marcia Bécu, Guillaume Tatur, Denis Sheynikhovich, Stephen Ramanoe, Catherine Agathos & Angelo Arleo: Age-related Preference for Geometric Cues during Real-world Navigation

Leandra Bucher, Kateryna Nural, Henrike Nagel, Roja Palma de Figuireido, Frank Zobel & Markus J. Hofmann: Searching for Culture-free Diagnostic Markers of Mild Cognitive Impairment in the Tactile Domain

Ismini Eleni Lokka & Arzu Çöltekin: Do Age Differences Affect Performance in 2D Sketching based on a First-person Perspective Route Learning Task

Mike Stieff, Mary Hegarty, Steve Franconeri, Stephanie Werner, Dane Desutter, Peri Gunlap, Zoe Rathbun, Nicole Jardine & Hauke Meyerhoff: Mechanisms of Visuospatial Thinking in STEM

Zoe Falomir: Practising Spatial Reasoning using Qualitative Descriptors and Computer Games

Priyanka Srivastava, Anurag Rimzhim & Sushil Chandra: Navigation in a 360-degree Virtual Environment

Svenja Neuneier, Stefan Müller & Eva Neidhardt: The Induced Roelofs Effect Presented in a Virtual Environment

Albert van der Veer, Matthew Longo, Adrian Alsmith, Hong Yu Wong, Heinrich Bülthoff & Betty Mohler: Where am I in Terms of my Physical and of my Perceived Body

Lisset Salinas Pinacho & Michael Beetz: Finding Regularities in Virtual Reality Human Motions Regarding Object Fetch and Place

Thinh Nguyen-Vo, Bernhard Riecke, Wolfgang Stuerzlinger, Duc-Minh Pham & Ernst Kruijff: Do We Need Actual Walking in VR?

Tina Vajsbaher & Holger Schultheiss: A Survey of Surgeon’s Perception and Awareness of the Role of Spatial Cognitive Abilities in Surgical Learning

Cancelled

Francis Harvey: Geographical Nearness and Graphical Nearness More or less Complicated than thought?

Eliyahu Greenberg, Asya Natapov & Dafna Fisher-Gewirtzman: Comparative Analysis of Case Studies Based on the Physical Effort Model (PEM)

Annina Brügger, Kai-Florian Richter & Sara Irina Fabrikant: Space-time Segmentation of Sensor Data along a Route

Ahmed Loai Ali & Christian Freksa: Influence of Cognitive Data Classification on VGI Quality

Cecilia Ferrando: Towards a Machine Learning Framework in Spatial Analysis

Thomas Hinterecker, Paolo Pretto, Ksander N. de Winkel, Hans-Otto Karnath, Heinrich H. Bülthoff & Tobias Meilinger: Egocentric Anisotropy in the Representation of Horizontal and Vertical Traveled Distance

Lisa Valentina Eberhardt & Anke Huckauf: Crowding Effects in Real Depth for Binocular and Monocular Observation

Angela Schwering, Sergey Mukhametov & Jakub Krukar: A Tool for Large-Scale Spatial Behavior Analysis in Indoor Environments


Rahul Kumar Ojha, Mainak Mandal, Debasis Mazumdar, Swati Banerjee & Kuntal Ghosh: Understanding the Geometry of Visual Space through Muller-Lyer Illusion

Jurgis Skilters & Liga Zarina: Axial Information as Determining in Geometric and Functional Stimuli

Angela Schwering, Sahib Jan, Krukar Jakub & Malumbo Chipofya: Evaluating Sketch Maps Qualitatively: A new Software-Supported Method

Gian-Luca Savino, Miriam Sturdee, Simon Runde, Christine Lohmeier, Brent Hecht & Johannes Schöning: MapRecorder - Analyzing Real World Usage of Mobile Map Applications
Friday, September 7

16:15  Excursion to Kloster Bebenhausen
       (included in registration fee; please bring your badge)

16:30  Tour Buses leave from Gmelinstraße
       (in front of the Conference Site)
       Program options: Guided tour through the monastery (1h) · Hike
to the vista point “Mörike ruhe” (one way 20 minutes) · Explore
the village on your own

18:30  Welcome Reception with Aperitif in the Cloister

19:00  Conference Dinner in the Summer Refectory

22:30  Tour Buses leave at the parking lot (back to Conference Site)
Detail of the Summer Refectory ceiling
we know a room as limited, defined by its borders. 
but what happens in VR when the physical borders are no longer? 
do we perceive virtual borders? do we cross them? where do we locate ourselves?

In an performative virtual reality installation Ilja Mirsky and Vivienne Mayer explore the (psychological) construct of borders and the potential of VR. They both studied Cognitive Science in Tübingen and are now looking for a way to combine their interest in (spatial) cognition and VR with performing arts or architecture.

VR Art Installation by Ilja Mirsky and Vivienne Mayer
On display on Thursday & Friday with occasional presentations
### Saturday, September 8

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<tr>
<td>9:00 – 10:15</td>
<td><strong>KEYNOTE 3</strong>&lt;br&gt;From Cognitive Maps to Cognitive Graphs&lt;br&gt;William H. Warren, Providence&lt;br&gt;Chair: Christian Freksa</td>
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<td>10:15 – 10:40</td>
<td><strong>Coffee Break</strong></td>
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<tr>
<td>10:40 – 11:00</td>
<td><strong>NAVIGATING in SPACE II</strong>&lt;br&gt;Chair: Lace Padilla</td>
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<tr>
<td>10:40 – 11:00</td>
<td>Electro cortical Evidence for Long-term Incidental Spatial Learning through Modified Navigation Instructions. Anna Wunderlich &amp; Klaus Gramann</td>
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<tr>
<td>11:00 – 11:20</td>
<td>Distinguishing Sketch-map Types. Jakub Krukar, Stefan Müller, Lucas Lörch, Vanessa Joy Anacta, Stefan Fuest &amp; Angela Schwering</td>
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<tr>
<td>11:20 – 11:40</td>
<td>Interactive Exploration of Sparse Virtual Environments to Investigate Action-driven Formation of Spatial Representations. Lukas Gehrke, John Rehner Iversen, Scott Makeig &amp; Klaus Gramann</td>
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<tr>
<td>11:40 – 12:00</td>
<td>Memory for Salient Landmarks. Rebecca Albrecht &amp; Rul von Stülpnagel</td>
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<td>12:20 – 14:00</td>
<td><strong>Lunch Break</strong></td>
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Saturday, September 8

14:00 – 17:00  Doctoral Colloquium

17:00 – 17:15  Concluding Remarks
Points of Interest

Conference venue: New Theology Building
Liebermeisterstraße 16-18 - 72076 Tübingen

Bus stop towards Max Planck Institute
for the Thursday evening demo tour

Nearby Hotels

H1: Hotel Katharina garni
    Lessingweg 2, 72076 Tübingen
    +49 7071 67021

H2: Hotel Barbarina
    Wilhelmstraße 94, 72074 Tübingen
    +49 7071 26048

H3: Hotel Krone
    Uhlandstraße 1, 72072 Tübingen
    +49 7071 13310

H4: Hotel DOMIZIL
    Wöhrdstraße 5-9, 72072 Tübingen
    +49 7071 1390
for detailed map check https://is.gd/spatcog18map
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<td>R1</td>
<td>Flavours of India</td>
<td>Mohlstraße 26, 72074 Tübingen</td>
<td>+49 7071 551554</td>
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<tr>
<td>R2</td>
<td>Die Kelter</td>
<td>Schmiedtorstraße 17, 72070 Tübingen</td>
<td>+49 7071 551196</td>
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<td>Restaurant Museum</td>
<td>Wilhelmstraße 3, 72074 Tübingen</td>
<td>+49 7071 122828</td>
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<td>R5</td>
<td>Tübinger Wurstküche</td>
<td>Am Lustnauer Tor 8, 72074 Tübingen</td>
<td>+49 7071 92750</td>
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<td>R6</td>
<td>Kichererbse</td>
<td>Metzgergasse 2, 72070 Tübingen</td>
<td>+49 7071 52171  Vegetarian</td>
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<td>R7</td>
<td>Krumme Brücke</td>
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<td>+49 7071 22466</td>
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<td>R8</td>
<td>Collegium</td>
<td>Lange Gasse 8, 72070 Tübingen</td>
<td>+49 7071 9208148</td>
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<td>Ratskeller</td>
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<td>Mauganeschtle</td>
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<td>Al Dente</td>
<td>Clinicumsgasse 22, 72070 Tübingen</td>
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<td>Neckarmüller</td>
<td>Gartenstraße 4, 72074 Tübingen</td>
<td>+49 7071 27848</td>
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<td>R14</td>
<td>Mensa Wilhelmstraße</td>
<td>Wilhelmstraße 13, 72074 Tübingen</td>
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