

Jakub Krukar, PhD

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RESEARCH

Academic Background

02.2015—	<p>On parental leave from 09.2018 until 03.2019</p> <p>Post-Doctoral Researcher, <i>Spatial Intelligence Lab, Institute for Geoinformatics, University of Münster, Germany.</i></p> <p>Wayfinding Through Orientation (‘WayTO’) project.</p> <ul style="list-style-type: none">• Involved in project management and recruitment of PhD candidates;• Co-supervising 3 PhD students, supervising and examining Master and Bachelor theses, supervising 1-2 student assistants per semester.
10.2016-03.2017	<p>Research Associate, <i>Substitution of Professor Angela Schwering as the Head of Spatial Intelligence Lab.</i></p> <ul style="list-style-type: none">• Principal supervision of PhD students, supervision and examination of Master and Bachelor theses;• Project management for the ‘WayTO’ project, research group coordination, budgeting (10+ researchers).
25.11.2015 (<i>viva voce</i> on 19.06.2015)	<p>PhD, <i>Department of Architecture and the Built Environment, Northumbria University, Newcastle, United Kingdom.</i></p> <p>The Influence of an Art Gallery’s Spatial Layout on Human Attention to and Memory of Art Exhibits</p> <p>Principal Supervisor: Prof. Ruth Conroy Dalton (Architecture). Second Supervisor: Prof. Chris Dorsett (Fine Arts).</p> <ul style="list-style-type: none">• 100% tuition fee waiver and a 3-year maintenance grant.
06.09.2011	<p>MA in Psychology, <i>University of Social Sciences and Humanities, Warsaw.</i></p> <p>Cross-Cultural Differences in Cognitive Representations of the Hagia Sophia Building in Istanbul</p> <p>Supervisor: Andrzej Strzalecki (Psychology).</p> <ul style="list-style-type: none">• Scholarships for excellent admission scores (year 1) and high GPA (year 2);• Erasmus Exchange (year 3) and Erasmus Internship (year 4) scholarships;• Student conference attendance scholarship (year 5).
01-12.2010 2003-2006	<p>Erasmus Exchange Programme. <i>Maltepe Universitesi, Istanbul, Turkey.</i></p> <p>Marie Skłodowska-Curie High School. <i>Gorzów Wielkopolski, Poland.</i></p>

Publications

- journals
- von Stülpnagel, R. and Krukar, J. (2018). Risk perception during urban cycling: An assessment of crowdsourced and authoritative data. *Accident Analysis & Prevention*, 121(May):109–117
- Ranasinghe, C., Krukar, J., and Kray, C. (2018). Visualizing Location Uncertainty on Mobile Devices. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies*, 2(1):1–22
- Schwering, A., Krukar, J., Li, R., Anacta, V. J., and Fuest, S. (2017). Wayfinding Through Orientation. *Spatial Cognition & Computation*, 17(4):273–303
- Krukar, J., Hölscher, C., and Conroy Dalton, R. (2017a). Indoor Wayfinding: Interview with Christoph Hölscher and Ruth Conroy Dalton. *German Journal of Artificial Intelligence (Künstliche Intelligenz)*, 31(2):185–191 (not peer-reviewed)
- Krukar, J., Schwering, A., and Anacta, V. J. (2017c). Landmark-Based Navigation in Cognitive Systems. *German Journal of Artificial Intelligence (Künstliche Intelligenz)*, 31(2):121–124
editorial to a special issue
- Krukar, J. (2014c). Walk, Look, Remember: The Influence of the Gallery’s Spatial Layout on Human Memory for an Art Exhibition. *Behavioural Sciences*, 4(3):181–201
- book chapters
- Dalton, R. C., Krukar, J., and Hölscher, C. (2018). Architectural cognition and behavior. In Montello, D. R., editor, *Handbook of Behavioral and Cognitive Geography*, pages 337–356. Edward Elgar Publishing, Cheltenham, UK
- Krukar, J., Dalton, R. C., and Hölscher, C. (2016). Applying HCI Methods and Concepts to Architectural Design (Or Why Architects Could Use HCI Even If They Don’t Know It). In Dalton, S. N., Schnädelbach, H., Wiberg, M., and Varoudis, T., editors, *Architecture and Interaction: Human Computer Interaction in Space and Place*, pages 17–35, Cham. Springer International Publishing
- conference proceedings
- Krukar, J., Münzer, S., Lörch, L., Anacta, V. J., Fuest, S., and Schwering, A. (2018a). Distinguishing Sketch Map Types: A Flexible Feature-Based Classification. In Creem-Regehr, S., Schöning, J., and Klippel, A., editors, *Spatial Cognition XI*, pages 279–292. Springer International Publishing, Cham
- Krukar, J., Schwering, A., Löwen, H., De Lima Galvao, M., and Anacta, V. J. (2018b). Rethinking Wayfinding Support Systems—Introduction. In Fogliarini, P., Ballatore, A., and Clementini, E., editors, *Proceedings of Workshops and Posters at the 13th International Conference on Spatial Information Theory (COSIT 2017)*, pages 151–152, Cham. Springer International Publishing
editorial to workshop proceedings

extended
abstracts
and posters

Löwen, H., Schwering, A., Krukar, J., and Winter, S. (2017). Perspectives in Externalizations of Mental Spatial Representations. In Bregt, A., Sarjakoski, T., van Lammeren, R., and Rip, F., editors, *Societal Geo-innovation. AGILE 2017. Lecture Notes in Geoinformation and Cartography*, pages 111–127, Cham. Springer

Krukar, J., Schultz, C., and Bhatt, M. (2017b). Towards Embodied 3D Isovists. In Heitor, T., Serra, M., Bacharel, J. P. S. M., and da Silva, L. C., editors, *Proceedings of the 11th Space Syntax Symposium*, Lisbon. Instituto Superior Tecnico, Departamento de Engenharia Civil, Arquitetura e Georrecursos

Anacta, V. J. A., Humayun, M. I., Schwering, A., and Krukar, J. (2017). Investigating Representations of Places with Unclear Spatial Extent in Sketch Maps. In Bregt, A., Sarjakoski, T., van Lammeren, R., and Rip, F., editors, *Societal Geo-innovation. AGILE 2017. Lecture Notes in Geoinformation and Cartography*, pages 3–17. Springer, Cham

Padmanaban, R. and Krukar, J. (2017). Increasing the Density of Local Landmarks in Wayfinding Instructions for the Visually Impaired. In Gartner, G. and Huang, H., editors, *Progress in Location-Based Services 2016*, pages 131–150, Cham. Springer International Publishing
publication developed from the student’s Master thesis (first author)

Krukar, J. and Conroy Dalton, R. (2013a). Spatial Predictors of Eye Movement in a Gallery Setting. In Kiefer, P., Giannopoulos, I., Raubal, M., and Hegarty, M., editors, *Eye Tracking for Spatial Research, Proceedings of the 1st International Workshop (in conjunction with COSIT 2013)*, pages 14–19, Scarborough, UK

Krukar, J. and Conroy Dalton, R. (2013b). Walk, Look, Remember: Art Galleries as Spaces Facilitating Memory. In Kim, Y. O., Park, H. T., and Seo, K. W., editors, *Proceedings of Ninth International Space Syntax Symposium*, pages 074:1–19, Seoul. Sejong University Press
presented at the plenary session of the Symposium

Schwering, A., Mukhametov, S., Krukar, J. (2018). A Tool for Large-Scale Spatial Behavior Analysis in Indoor Environments. In *Spatial Cognition 2018*, Tübingen, Germany

Schwering, A., Sahib, J., Krukar, J., Chipofya, M. (2018). Evaluating Sketch Maps Qualitatively: A new Software-Supported Method. In *Spatial Cognition 2018*, Tübingen, Germany

Münzer, S., Lörch, L., Schwering, A., Krukar, J., Anacta, V.J. (2018). Wayfinding and Spatial Learning with Navigation Assistance. In *The 40th Annual Meeting of the Cognitive Science Society*, Madison, USA.

Löwen, H., Krukar, J., Schwering, A. (2018). How should Orientation Maps look like? In *The 21th AGILE International Conference on Geographic Information Science: AGILE 2018*, Lund, Sweden.

Löwen, H., Krukar, J., Schwering, A. (2018). Towards automatically generating maps for wayfinding and orientation. In *The 21th AGILE International Conference on Geographic Information Science: AGILE 2018*, Lund, Sweden.

- Krukar, J. (2017). Cognitively Sustainable Built Environments. In *Annual Meeting of the American Association of Geographers*, Boston, USA
- Krukar, J. and Schwering, A. (2016). What is Orientation? In Barkowsky, T. B., Falomir Llansola, Z., Schultheis, H., and van de Ven, J., editors, *KogWis: 13th Biannual Conference of the German Cognitive Science Society*, pages 115–117, Bremen, Germany
- Anacta, V., Krukar, J., Humayun, M., and Schwering, A. (2016). Visualizing salient features in spatial descriptions. In *Poster at European Workshop on Image and Cognition (EWIC)*, Paris, France
- Du, G., Lohoff, L., Krukar, J., and Mukhametov, S. (2016). Comparing Two Methods to Overcome Interaction Blindness on Public Displays. In *Proceedings of the 5th ACM International Symposium on Pervasive Displays, PerDis '16*, pages 243–244, New York, NY, USA. ACM
publication developed from the students' course project
- von Stulpnagel, R., Wachter, L., Holland, N., and Krukar, J. (2016). Subjective Risk Perception in Urban Cycling - Assessing The Validity of Opinion-Based Volunteer Geographic Information. In *"Vulnerable road users" Symposium at the 57. Tagung Experimentell Arbeitender Psychologen*, Heidelberg, Germany
- Krukar, J. and von Stulpnagel, R. (2015). Adjusting for Cognitive and Spatial Biases of VGI: The Case of Perceived Risks in Urban Cycling. In Skov-Petersen, H., editor, *Human mobility, cognition and GISc*, Copenhagen
- Conroy Dalton, R. and Krukar, J. (2014; equal contribution). Augmenting Intuitive Navigation at Local Scale. *Spatial Search Specialist Meeting in Santa Barbara; Dec 2014*
- Krukar, J. (2014a). Cognitively Biased Agent-Based Models. In Emo, B., Al Sayed, K., and Varoudis, T., editors, *'Design Cognition and Behavior: Usability in the Built Environment'*. *Proceedings of the workshop held at Spatial Cognition 2014*, pages 4–5, Bremen, Germany
- Krukar, J. (2014b). Spontaneous Memory of Art Exhibitions: Explanations from Eye-Tracking. In Freksa, C., Nebel, B., Hegarty, M., and Barkowsky, T., editors, *Spatial Cognition 2014: Poster Presentations*, pages 60–63, Bremen, Germany
- Krukar, J. and Conroy Dalton, R. (2012). Towards a Unified Model of Building Usability. In *22nd International Association People-Environment Studies (IAPS) Conference*, Glasgow, UK

Editorial Experience

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| Journals | <i>Künstliche Intelligenz - German Journal of Artificial Intelligence (Springer)</i> - guest co-editor of the special issue on “Landmark-Based Navigation in Cognitive Systems”
http://www.springer.com/computer/ai/journal/13218 |
| Workshops | <i>Rethinking Wayfinding Support Systems</i> workshop organised at the 13th International Conference on Spatial Information Theory (COSIT 2017)
http://www.cosit2017.org |

Program Committee Member

Conference on Spatial Information Theory (COSIT 2017)

Reviewer for

Journals	<i>Computers, Environment and Urban Systems</i> <i>Journal of Location-based Services</i> <i>Environment and Planning B: Planning and Design</i> <i>International Journal of Design Creativity and Innovation</i> <i>IxD&A: Interaction Design and Architecture Journal</i> <i>Journal of Urban Technology</i>
Conferences	<i>Conference on Spatial Information Theory (COSIT)</i> <i>Cognitive Science Society (CogSci)</i> <i>Eye-Tracking Research and Applications (ETRA)</i> <i>Spatial Cognition Conference</i>
Books	<i>European Handbook of Crowdsourced Geographic Information</i> , Ubiquity Press

Doctoral and Post-Doctoral Training

2017	Bayesian Modeling for Cognitive Science <i>University of Amsterdam.</i> Growing Your Leadership Skills <i>University of Münster.</i>
2016	Managing Conflicts <i>University of Münster.</i> Summer School on Topological and Scaling Analyses. <i>EU COST Action TU1305, Gävle University, Sweden.</i> Finding Funding - an introduction to the German funding system <i>University of Münster.</i> Geo-Ethics Symposium. <i>University Twente, Netherlands.</i> Eye Tracking—Experimental Design, Implementation, and Analysis <i>Winter School, ETH Zürich.</i>
2015	EU Funding for Early-Career Researchers. <i>European Research Services.</i>
2014	Innovation Challenge Knowledge Exchange School. <i>5-day long training programme on business-academic collaboration organised by The Work Foundation, London, UK.</i> Talk Nerdy to Me. <i>Public engagement seminar organised by the British Science Association.</i>
2013	Introduction to Computational Space Syntax. <i>9th International Space Syntax Symposium in Seoul, South Korea.</i> International Spatial Cognition Summer Institute. <i>University of California Santa Barbara, USA.</i>
2012	ProAnVis—Processing, Analysis and Visualisation of Tracking Data. <i>COST Action, TU Delft, NL.</i>

Pre-Doctoral Research Experience and Employment

Oct–Dec 2010	Erasmus-Sponsored Intern. <i>E-Medya Consultancy, Istanbul.</i> Oversaw usability studies in webdesign and architecture (way-finding systems and behavioural mapping).
Dec 2009	Intern. <i>UseLab Research Company, Warsaw.</i> Conducted website eye-tracking research for a corporate client from the banking sector.
2007–2008	Volunteer Research Assistant. <i>Institute of Psychology, University of Social Sciences and Humanities, Warsaw.</i> Conducted experiments and assisted in data analysis throughout a project on mechanisms of implicit memory.

Research Skills and Methods

desktop and mobile eye-tracking, architectural analysis (Space Syntax), advanced statistics (linear mixed-effects models), R

IMPACT

Invited Academic Talks and Expert Meetings

July 2018	Center for Cognitive Science. <i>University of Freiburg, Germany (invited research talk).</i>
Mar 2016	Chair of Cognitive Science. <i>ETH Zürich, Switzerland (invited research talk).</i>
Jun 2015	Rethinking the Senses: Experimental Approaches and Methods in the Art Museum. <i>TATE Modern and Centre for the Study of the Senses at the University of London (expert meeting).</i> http://bit.ly/1W4X94R
May 2015	Center for Cognitive Science. <i>University of Freiburg, Germany (invited research talk).</i>

Public Engagement

Feb 2014	What are you staring at? Space, Psychology, Eye-Tracking. <i>BWA Dizajn Centre for Contemporary Arts, Wroclaw, Poland.</i> Designed and conducted a workshop on Eye-Tracking and Space Syntax techniques for curatorial design.
Oct 2013	Field study. <i>BALTIC Centre for Contemporary Art, Newcastle, UK.</i> Oversaw a Mobile Eye-Tracking study in a working art gallery, involving its staff and visitors.
2012	Popular science articles. <i>‘Zielone Miasto’ [Green City] Magazine, Poland.</i> A series of articles on sustainability and city livability [<i>in Polish</i>].

Policy

Mar 2014	Visual Museum Experiment. <i>Cultural NGOs, Warsaw, Poland.</i> http://wizualnyeksperymentmuzealny.wordpress.com Member of a working group of academics, curators, and art educators designing action scenarios for museums in Poland. Scenarios and guidelines published under a Creative Commons licence.
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TEACHING

Supervision

PhD	Co-supervising 3 PhD students involved in the ‘WayTO’ project. Moderating the meetings of the <i>Graduate School of Geoinformatics</i> - an internal body providing support to the Institute’s PhD students through monthly, research skills-oriented supervision meetings.
MA theses	<i>Stop and Think: Pauses During Giving Route Instructions</i> - Yusi Ji <i>Landmark-Based Wayfinding System for the Blind</i> - Rajchandar Padmanaban <i>Visualizing Off-Screen Landmarks on Maps for Mobile Devices</i> - Maurin Radtke <i>Conceptual Design, Implementation and Evaluation of a Motorbike Group Riding System with a Focus on a Group Navigation Feature</i> - Fabian Röhr <i>Location-Based Notifications to Encourage VGI Participation and Contribution: Combining persuasive technologies with citizen science for controlled intervention</i> - Joanna Kwong <i>Environmental Forms and Route Directions: Influences on the Acquisition of Spatial Knowledge</i> - Stefan Fuest <i>Predefining regionalised environments for assisted navigation</i> - Caitlin Lara Thorn <i>Pointing to a place across a barrier: Study of barriers effect on human survey knowledge</i> - Sarah Abdelkader <i>A Gesture Inspired Navigation Support</i> - Shankarlingam Sundaresan <i>Analysis of the validity and reliability of the Sketch Map Classifier tool</i> - Laura Meierkort <i>Embodied 3d Isovist as a Predictor of Spatial Experience</i> - Charu Manivannan
BA theses	<i>Space Syntax and Navigation</i> - Bartosz Mazurkiewicz <i>Towards a ‘Calm’ Navigational System</i> - Boris Stöcker <i>Visibility Analysis of the GEO1 and Psychology Buildings, in Comparison (Space Syntax)</i> - Lasse Einfeldt <i>Designing a Research Tool for Studying Real-time Uncertainty in Inferring Spatial Knowledge while Drawing a Sketch Map</i> - Torben Kraft
Assistants	Overlooking and supervising research of 1–2 Student Assistants per semester.

Courses Taught

2018	<i>Linear-Mixed Effect Models</i> (internal full-day workshop for research staff)**
2017	<i>Spatial Cognition</i> (MA; lecture and seminar)*
2016	<i>Research Methods in HCI</i> (MA; lecture and seminar)* <i>Interaction with Geographic Information</i> (BA; lecture and seminar)*
2015	<i>Research Methods in HCI</i> (MA; lecture and seminar)* <i>SenseBox for People-Centred Urban Planning</i> (study project)* <i>Architectural Design</i> (study project)* <i>Human-Computer Interaction and Usability</i> (BA; seminar and lecture)

*co-responsible for course design

**solely responsible for course design

SERVICE

ethics	Designed and supervised the implementation of an institute-wide ethics clearance policy for all studies involving human participants.
data protection	Co-designed and supervised the implementation of an institute-wide data protection policy and server infrastructure.

FUNDING

As Postdoctoral Researcher

Research Grants	1200 EUR early-stage research bursary. <i>AGILE: Association of Geographic Information Laboratories in Europe.</i>
Travel Grants	1100 EUR for participating in the course on Bayesian Modeling for the Cognitive Science. <i>German Academic Exchange Service (DAAD).</i>

As PhD Student

Individual Travel Grants	Secured over £4700 of travel funding from organisations: <i>Experimental Psychology Society (Grindley Grant)</i> , <i>Spatial Cognition Research Center SFB/TR 8, MOVE (COST Action IC0903)</i> , <i>COSIT2013</i> , <i>University of California Santa Barbara</i> , <i>ETH Zürich</i> , <i>Northumbria University Graduate School (x3)</i> .
Public Engagement	Secured over £900 towards the costs of attending and co-organising public engagement activities (see section on Public Engagement).
Conference Volunteering	Volunteered as staff at <i>MuseumNext2012</i> and <i>GIScience2014</i> conferences in exchange for a fee waiver.

OTHER

Languages spoken

Polish	Native.
English	Professional Fluency.
German	B1-Level Certificate (intermediate).