

Jakub Krukar, PhD

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born: 20.09.1987; nationality: Polish; married, 1 child

PROFILE

02.2015—	Post-Doctoral Researcher <i>Institute for Geoinformatics, University of Münster, Germany.</i>
08-09.2019	Visiting Research Fellow <i>Future Cities Laboratory, Singapore-ETH Centre, Singapore.</i> Invited by Prof. Hölscher's Cognition, Perception and Urban Behaviour Group.
9.2018-3.2019	Career break for parental leave.
10.2016- 03.2017	Research Associate <i>Institute for Geoinformatics, University of Münster, Germany.</i> Substitution of Prof. Angela Schwering as the Head of Spatial Intelligence Lab (tasks incl. principal supervision of PhD/MSc students and project management).
25.11.2015	PhD (<i>viva voce</i> on 19.06.2015) <i>Department of Architecture and Built Environment, Northumbria University, Newcastle, United Kingdom.</i> “The Influence of an Art Gallery’s Spatial Layout on Human Attention to and Memory of Art Exhibits.” Principal Supervisor: Prof. Ruth Conroy Dalton (Architecture). Second Supervisor: Prof. Chris Dorsett (Fine Arts).
6.9.2011	MA degree in Psychology <i>University of Social Sciences and Humanities, Warsaw.</i> “Cross-Cultural Differences in Cognitive Representations of the Hagia Sophia Building in Istanbul.” Supervisor: Andrzej Strzalecki (Psychology).
2007–2008	Volunteer Research Assistant. <i>Institute of Psychology, University of Social Sciences and Humanities, Warsaw, Poland.</i>
10-12.2010	Erasmus-Sponsored Intern. <i>E-Medya Consultancy, Istanbul, Turkey.</i>
1-7.2010	Erasmus Exchange Student. <i>Maltepe Üniversitesi, Istanbul, Turkey.</i>
12.2009	Intern. <i>UseLab Website Usability Research Company, Warsaw, Poland</i>
2003-2006	Marie Skłodowska-Curie High School. <i>Gorzów Wielkopolski, Poland.</i>

FUNDING AND AWARDS

Project funding received

2021-2025	<p>Project Title: 3D Sketch Maps</p> <p>Role: Co-author of the proposal and a postdoc funded by the project.</p> <p>Amount: ca. €286 000 (share in a €1.1M project)</p> <p>Source: Swiss National Science Foundation within the programme “Sinergia – interdisciplinary, collaborative and breakthrough”.</p> <p>Partners: ETH Zürich Chair of Geoinformation Engineering (Prof. Martin Raubal), ETH Zürich Chair of Cognitive Science (Prof. Christoph Hölscher), Future Cities Lab Singapore, Institute for Geoinformatics, University of Münster.</p>
2022-2023	<p>Project Title: Evidence-along-Design: A proof-of-concept for changing an architectural paradigm with geoinformatics methods</p> <p>Role: Principal Investigator</p> <p>Amount: €3 938</p> <p>Source: Seed grant / internal faculty funding Covered the costs of preparing a €700 000 proposal together with TU Wien. Planned submission: May 2023.</p>
under review	<p>Project Title: SketchMapia: A research software to analyse sketch maps in social and natural sciences.</p> <p>Role: Co-Principal Investigator</p> <p>Amount: €385 000</p> <p>Source: DFG</p>

Individual scholarships

2019	<p>Future Cities Visiting Research Fellowship.</p> <p>Amount: ca. €12 000</p> <p>Source: Future Cities Laboratory, Singapore-ETH Centre, Singapore.</p>
2016-2019	<p>Miscellaneous grants for early-career researchers.</p> <p>Amount: in sum ca. €3000</p> <p>Source: VolkswagenStiftung, DAAD, AGILE.</p>
2011-2014	<p>PhD fee waiver and maintenance grant.</p> <p>Amount: in sum ca. £80 000.</p> <p>Source: Northumbria University, Newcastle, UK.</p>

2011-2014	Miscellaneous PhD travel funding. Amount: In sum, over £5600 . Sources: Experimental Psychology Society (Grindley Grant), Spatial Cognition Research Center SFB/TR 8, MOVE (COST Action IC0903), COSIT2013, University of California Santa Barbara, ETH Zürich, Northumbria Graduate School.
2006-2011	Miscellaneous MA funding and awards. 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).

External nominations and renounced job offers

2023	Renounced Tenure-Track Assistant Professorship position from the Technical University of Eindhoven.
2016-2022	Renounced postdoctoral job offers from Harvard University, Future Cities Lab Singapore and ETH Zurich.
2019	Heinz Maier-Leibnitz-Preis. University of Münster's nominee for the Heinz Maier-Leibnitz-Preis of the German Research Foundation (DFG). Each German university can nominate up to 2 untenured researchers per year for "outstanding research achievements".

Funding sought

2021	Project Title: The Cognitive Cost of Wayfinding: Developing a unified measure to compare different navigational scenarios. Role: Principal Investigator Amount: ca. €1 300 000 Source: German Research Foundation (DFG) Emmy Noether programme. Rejected. 4 out of 5 reviews "strongly recommended" funding the project.
2021	Project Title: Evidence-along-Design: A New Method for User-Centric Architectural Design. Role: Principal Investigator Amount: €500 000 Source: Branco Weiss fellowship. Rejected.
2020	Project Title: How to design buildings in which no one ever gets lost. Role: Principal Investigator Amount: €120 000 Source: Volkswagen Foundation's Experiment! programme. Rejected.

2016	<p>Project Title: Assessing Cognitive and Spatial Biases of Opinion-Based VGI on Subjective Risk Perception.</p> <p>Role: Co-Principal Investigator</p> <p>Amount: ca. €460 000</p> <p>Source: German Research Foundation (DFG)</p> <p>Rejected.</p>
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RESEARCH

Open and Reproducible Science

Publishes data and code of most recent publications on the Open Science Framework profile: <http://osf.io/9ruhs>.

Member of the Reproducibility working group within the Editorial Board of the Journal of Global Environmental Psychology.

Member of the Reproducibility Committee for the AGILE International Conference on Geographic Information Science. Author of “reproducibility reviews” reviewing the reproducibility of submitted conference contributions.

Editorial and Organisational Experience

Journals	<p>Journal of Global Environmental Psychology</p> <p>Associate Editor of a newly created journal sponsored by the PsychOpen GOLD initiative (https://psychopen.eu). Journal’s mission is to increase open science practices and diversity in environmental psychology. Associate Editors were selected in a competitive process (21 out of 328 candidates).</p>
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Künstliche Intelligenz - German Journal of Artificial Intelligence.

Guest co-editor of the special issue on *Landmark-Based Navigation in Cognitive Systems* (Springer).

<http://www.springer.com/computer/ai/journal/13218>

Workshops	<p>HabiTech: Inhabiting Buildings, Data & Technology</p> <p>Workshop accepted to be held at the <i>Computer-Human Information (CHI 2020) Conference</i> in Honolulu, USA. Conference cancelled due to COVID-19.</p> <p>http://chi2020.acm.org</p>
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Rethinking Wayfinding Support Systems

Workshop organised at the *13th International Conference on Spatial Information Theory (COSIT 2017) in L’Aquila, Italy*.

<http://www.cosit2017.org>

Program Committee Member

Eye Tracking for Spatial Research Workshop (ET4S 2020)

Eye Tracking Research and Application (ETRA 2019, 2020)

Conference on Spatial Information Theory (COSIT 2017, 2019)

Reviewer for

Journals	<i>Applied Cognitive Psychology</i> <i>Spatial Cognition and Computation</i> <i>Cognitive Research: Principles and Implications</i> <i>Environment and Planning B: Urban Analytics and City Science</i> <i>International Journal of Geographical Information Science</i> <i>Computers, Environment and Urban Systems</i> <i>Frontiers in Psychology</i> <i>Journal of Location-based Services</i> <i>Tourism Geographies</i> <i>ISPRS International Journal of Geo-information</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> <i>Designing Interactive Systems Conference (DIS)</i>
Books	<i>European Handbook of Crowdsourced Geographic Information</i> , Ubiquity Press

Invited Academic Talks

July 2018	<i>Center for Cognitive Science, University of Freiburg, Germany.</i>
May 2016	<i>Chair of Cognitive Science, ETH Zürich, Switzerland.</i>
May 2015	<i>Center for Cognitive Science, University of Freiburg, Germany.</i>

Key Research Methods

Eye-tracking	desktop and mobile eye-tracking (Tobii, PupilLabs, SMI), including eye-tracking inside Virtual Reality (VIVE Pro Eye)
Virtual reality	designed and published virtual reality experiments in Unity 3D (driving simulator, pedestrian indoor navigation, indoor space perception)
Statistics	R, Bayesian multilevel models (incl. logistic, survival and other regression-based analyses), Structural Equation Models, circular statistics, writing R Shiny applications for exploratory analysis of complex data
Architectural analysis	Space Syntax, isovist analysis, co-visibility analysis

Languages

English	Full professional proficiency
Polish	Native proficiency
German	Intermediate (C1)

COMMUNICATION AND IMPACT

Interdisciplinarity

I actively maintain an interdisciplinary research profile by publishing and reviewing within top-tier journals across three core disciplines. I bring this experience into the classroom by delivering lectures that emphasize interdisciplinary applications of geoinformatics. I submit interdisciplinary research grant proposals that undergo simultaneous peer-review from multiple discipline committees. Examples:

	cognitive psychology	architectural science	geoinformatics
published in...	Journal of Environmental Psychology	Environment and Planning B	Journal of Spatial Information Science
reviewed for...	Spatial Cognition and Computation	Computers, Environment and Urban Systems	International Journal of Geographical Information Science
is teaching...	Spatial Cognition course	classes on Space Syntax and indoor wayfinding	Wayfinding and Navigation course

Public Engagement

Apr 2021	Article for “der architekt”. <i>Association of German Architects, Berlin.</i> Invited to contribute an article to the official journal of the Association of German Architects on the topic of architectural psychology and wayfinding.
Sep 2019	“Wayfinding Through Orientation”. <i>Future Cities Lab, Singapore.</i> Invited lunch-time talk for staff and visitors.
2016-2020	“Wayfinding Through Orientation”. <i>Institute for Geoinformatics, University of Münster, Germany.</i> Contributed to a series of press releases, and the production of promotional video material explaining the project topic to the general public. Press articles and interviews on the subject of navigational skills, e.g.: “Den Orientierungssinn kann man verlernen” <i>Sueddeutsche Zeitung</i> , 10.04.2015.
Jun 2015	“Rethinking the Senses: Experimental Approaches and Methods in the Art Museum.” <i>TATE Modern gallery, London.</i> Invited as a member of an expert discussion panel. Meeting co-organised by the Centre for the Study of the Senses at the University of London.
Feb 2014	“What are you staring at? Space, Psychology, Eye-Tracking.” <i>BWA-Dizajn Centre for Contemporary Arts, Wroclaw, Poland.</i> Invited to design and conduct a workshop on Eye-Tracking and Space Syntax techniques for curatorial design.
2012	Popular science articles. <i>“Zielone Miasto” [“Green City”] Magazine, Poland.</i> Wrote a series of articles on sustainability and city livability [in Polish].

Policy

Mar 2014	Visual Museum Experiment. <i>Cultural NGOs, Warsaw, Poland.</i> 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 license. http://wizualnyeksperymentmuzealny.wordpress.com
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Industry Outreach

2016-2020	Wayfinding Through Orientation Supervision of a MSc thesis conducted in collaboration with BOSCH : <i>Driver stress level prediction</i> by Nico Steffens. Supervision of a MSc thesis conducted in collaboration with BWM : <i>Conceptual Design, Implementation and Evaluation of a Motorbike Group Riding System with a Focus on a Group Navigation Feature</i> by Fabian Röhr. Co-wrote a proof-of-concept ERC grant proposing a pathway for bringing the “Wayfinding Through Orientation” prototype to the market (outcome: waiting list).
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TEACHING

Courses Designed and Taught

	Delivered teaching for the following study programmes: Bachelor (BSc) in Geoinformatics, Master of Science (MSc) in Geoinformatics, Master of Science (MSc) in Geo-spatial Technologies, Master of Science (MSc) in Geoinformatics and Spatial Data Science, and Ph.D. Graduate School for Geoinformatics.
SuSe 2022	<i>Spatial Cognition</i> (MSc; lecture and seminar; 5 ECTS; 7 students)
WS 2021/22	<i>Wayfinding and Navigation</i> (MSc; lecture and seminar; 5 ECTS; 15 students) <i>Semantic Trajectory Analysis</i> (MSc; block course; 5 students)
SuSe 2021	<i>Spatial Cognition</i> (MSc; lecture and seminar; 3 ECTS; 21 students) <i>Reproducible Research</i> (block course within Ph.D. Graduate School; 5 PhD students) https://github.com/kubakrukar/ifgi-GSGI/wiki/Reproducible-research
WS 2020/21	<i>Wayfinding and Navigation</i> (MSc; lecture and seminar; 5 ECTS; 15 students)
SuSe 2020	<i>Spatial Cognition</i> (MSc; lecture and seminar; 3 ECTS; 32 students)

WS 2019/20	<i>Wayfinding and Navigation</i> (MSc; lecture and seminar; 5 ECTS; 12 students) <i>Bayesian Mixed Effect Models with brms R package</i> (guest class at Future Cities Lab, Singapore)
SuSe 2019	<i>Spatial Cognition</i> (MSc; lecture and seminar; 3 ECTS; 26 students)
SuSe 2018	<i>Spatial Cognition</i> (MSc; lecture and seminar; 3 ECTS; 25 students) <i>Linear-Mixed Effect Models</i> (training for PhD students)
WS 2017/18	<i>HCI research methods: developing and evaluating interactive systems with users</i> (MSc; lecture and seminar; 5 ECTS; 9 students)
SuSe 2017	<i>Interaction with Geographic Information</i> (BSc; lecture and seminar; 13 students)
WS 2016/17	<i>HCI research methods: developing and evaluating interactive systems with users</i> (MSc; lecture and seminar; 5 ECTS)
SuSe 2016	<i>Interaction with Geographic Information</i> (BSc; lecture and seminar)
WS 2015/16	<i>Human-Computer Interaction and Usability</i> (BSc; seminar and lecture) <i>SenseBox for People-Centred Urban Planning</i> (MSc, study project)
SuSe 2015	<i>Architectural Design</i> (MSc, study project)

Student Supervision

	Supervised 4 PhD students, 14 MSc theses, 4 BSc theses, and 1-2 student assistants per semester.
Graduate School	Moderating the meetings of the Graduate School of Geoinformatics - an internal body providing support to the Institute's PhD students through monthly, research skills-oriented meetings. Role: conceptualization of content, meeting organization and moderation. https://github.com/kubakrukar/ifgi-GSGI
PhD	Co-supervising 4 PhD students: Charu Manivannan (ongoing) <i>Generalization in Sketch Maps</i> Marcelo de Lima Galvao (disputation on 11.05.2022) <i>Route Map Schematisation with Landmarks</i> Heinrich Löwen (disputation on 28.05.2020) <i>Orientation Information in Wayfinding Instructions: Selection and Evaluation of Route Dependent Information for Wayfinding and Orientation Support</i>

	<p>Vanessa Joy Anacta (disputation on 8.10.2018) <i>Empirical Investigation of Orientation Information in Wayfinding Instructions.</i></p> <p>Regularly advising other PhD students at the Institute on the issues of experimental design and statistical analysis.</p>
MSc theses	<p><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 (in collaboration with BMW) <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 <i>The influence of tasks on the reliability of sketch map analysis methods</i> - Antonia van Eek <i>Driver stress level prediction</i> - Nico Steffens (in collaboration with Bosch GmbH) <i>The Influence of Egocentric and Allocentric Navigation Support in Virtual Buildings on Navigation Performance</i> - Ilka Pleiser</p>
BSc theses	<p><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</p>
Assistants	<p>Overlooking and supervising research of 1–2 Student Assistants per semester.</p>
External	<p>Supervising external PhD visit (2023): Abdelbasset Laroui. <i>University of Ghardaia Algeria</i> Supervising external PhD visit (2019): Dajana Snopková . <i>Department of Geography, Masaryk University, Brno, Czech Republic.</i> External examiner (2019). <i>MSc Programme, Geo-Information Science and Earth Observation (ITC), University of Twente, The Netherlands.</i></p>

SERVICE

ethics	Head of the Institute's Ethics Committee (2019–). Designed and supervised the implementation of an institute-wide ethics clearance policy for all studies involving human participants (2017-2018).
data protection	Co-designed and supervised the implementation of an institute-wide data protection policy and server infrastructure (2017-2018).

REFERENCES

Prof. Angela Schwering

	Current employer and collaborator.
	Director of the Institute for Geoinformatics Head of Spatial Intelligence Lab
address	Institute for Geoinformatics University of Muenster Heisenbergstr. 2 48149 Muenster, Germany
phone	+49 (251) 83-33059
email	schwering@uni-muenster.de

Prof. Christoph Hölscher

	External examiner of my doctoral project, ongoing collaborator, co-author on project proposals, host at the Future Cities Lab in Singapore (08.2019-09.2019).
	Professor of Cognitive Science ETH Zürich, Switzerland Future Cities Lab, Singapore
address	RZ E 23 Clausiusstrasse 59 8092 Zurich, Switzerland
phone	+41 44 632 31 96
email	christoph.hoelscher@gess.ethz.ch

Prof. Carl Schultz

	Collaborator in the area of computational architecture.
	Associate Professor
address	Department of Electrical and Computer Engineering Aarhus University Abogade 34, building 5341, 123 8200 Aarhus, Denmark
email	cschultz@ece.au.dk