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LIST OF PUBLICATIONS

- Open Science statement.** My most recent first-author publications include an accompanying Open Science Framework (OSF) with supplemental material such as transparency checklists, code, and data: <http://osf.io/9ruhs>.
- journals **Krukar, J.**, Navas Medrano, S., and Schwering, A. (2023). Route effects in city-based survey knowledge estimates. *Cognitive Processing*, 24(2), 213–231. <https://doi.org/10.1007/s10339-022-01122-0>
[[pdf]] [[code and data]]
- Krukar, J.**, van Eek, A., & Schwering, A. (2023). Task-dependent sketch maps. *Spatial Cognition & Computation*, <https://doi.org/10.1080/13875868.2023.2170802>
[[pdf]] [[code and data]]
- Somaskantharajan, S., Degbelo, A., and **Krukar, J.** (2023). An Exploratory Study of Models of Mobile Map User Experience. *Journal of Cartography and Geographic Information*, <https://doi.org/10.1007/s42489-023-00136-8>
[[pdf]] [[code and data]]
- Galvão, M. L., **Krukar, J.**, & Schwering, A. (2023) Schematizing car routes with their surrounding street network. *Cartography and Geographic Information Science*, 50(1), 20–43. <https://doi.org/10.1080/15230406.2022.2125077>
[[pdf]] [[code and data]]
- Manivannan, C., **Krukar, J.**, and Schwering, A. (2022). Spatial generalization in sketch maps: A systematic classification. *Journal of Environmental Psychology*, 83, 101851. <https://doi.org/10.1016/j.jenvp.2022.101851>
[[pdf]] [[code and data]]
- Krukar, J.**, Manivannan, C., Bhatt, M., and Schultz, C. (2021). Embodied 3D isovists: A method to model the visual perception of space. *Environment and Planning B: Urban Analytics and City Science*, 48(8), 2307–2325. <https://doi.org/10.1177/2399808320974533>
[[pdf]] [[code and data]]

Galvão, M. L., **Krukar, J.**, and Schwering, A. (2021). Evaluating schematic route maps in wayfinding tasks for in-car navigation. *Cartography and Geographic Information Science*, 48(5), 449–469. <https://doi.org/10.1080/15230406.2021.1943531> [\[\[pdf\]\]](#) [\[\[code and data\]\]](#) [\[\[accompanying app\]\]](#)

Li, H., Mavros, P., **Krukar, J.**, and Hölscher, C. (2021). The effect of navigation method and visual display on distance perception in a large-scale virtual building. *Cognitive Processing*, 1–21. <https://doi.org/10.1007/s10339-020-01011-4> [\[\[pdf\]\]](#)

Krukar, J., Anacta, V. J., & Schwering, A. (2020). The effect of orientation instructions on the recall and reuse of route and survey elements in wayfinding descriptions. *Journal of Environmental Psychology*, 68, 101407. doi: 10.1016/j.jenvp.2020.101407 [\[\[pdf\]\]](#) [\[\[code and data\]\]](#)

Krukar, J., & Dalton, R. C. (2020). How the Visitors' Cognitive Engagement Is Driven (but Not Dictated) by the Visibility and Co-visibility of Art Exhibits. *Frontiers in Psychology*, 11. doi: 10.3389/fpsyg.2020.00350 [\[\[pdf\]\]](#) [\[\[code and data\]\]](#)

Galvao, M., **Krukar, J.**, Nöllenburg, M., & Schwering, A. (2020). Route schematization with landmarks. *Journal of Spatial Information Science*, 21. doi: 10.5311/JOSIS.2020.21.589 [\[\[pdf\]\]](#)

Löwen, H., **Krukar, J.**, & Schwering, A. (2019). Spatial Learning with Orientation Maps: The Influence of Different Environmental Features on Spatial Knowledge Acquisition. *ISPRS International Journal of Geo-Information*, 8(3), 149. doi: 10.3390/ijgi8030149 [\[\[pdf\]\]](#)

von Stülpnagel, R., & **Krukar, J.** (2018). Risk perception during urban cycling: An assessment of crowdsourced and authoritative data. *Accident Analysis & Prevention*, 121(May), 109–117. doi: 10.1016/j.aap.2018.09.009 [\[\[pdf\]\]](#)

Ranasinghe, C., **Krukar, J.**, & Kray, C. (2018). Visualizing Location Uncertainty on Mobile Devices. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies*, 2(1), 1–22. doi: 10.1145/3191762 [\[\[pdf\]\]](#)

Schwering, A., **Krukar, J.**, Li, R., Anacta, V. J., & Fuest, S. (2017). Wayfinding Through Orientation. *Spatial Cognition & Computation*, 17(4), 273–303. doi: 10.1080/13875868.2017.1322597

most-read paper in journal's history
[\[\[pdf\]\]](#)

Krukar, J., Hölscher, C., & Conroy Dalton, R. (2017). Indoor Wayfinding: Interview with Christoph Hölscher and Ruth Conroy Dalton. *German Journal of Artificial Intelligence (Künstliche Intelligenz)*, 31(2), 185–191. doi: 10.1007/s13218-016-0483-3

(not peer-reviewed)

[[pdf]]

Krukar, J., Schwering, A., & Anacta, V. J. (2017). Landmark-Based Navigation in Cognitive Systems. *German Journal of Artificial Intelligence (Künstliche Intelligenz)*, 31(2), 121–124. doi: 10.1007/s13218-017-0487-7

editorial to a special issue (not peer-reviewed)

[[pdf]]

Krukar, J. (2014). Walk, look, remember: The influence of the gallery’s spatial layout on human memory for an art exhibition. *Behavioral Sciences*, 4(3), 181–201. doi: 10.3390/bs4030181

[[pdf]]

book chapters

Krukar, J. (in press). A Stimulating Museum Space: Glimpsing away and engaging working memory in-between exhibits. In J. Peponis (Ed.), *Museum Configurations: An inquiry into the design of spatial syntaxes*

Dalton, R. C., **Krukar, J.**, & Hölscher, C. (2018). Architectural cognition and behavior. In D. R. Montello (Ed.), *Handbook of Behavioral and Cognitive Geography* (pp. 337–356). doi: 10.4337/9781784717544.00030

[[pdf]]

invited contribution to a seminal handbook.

Krukar, J., Dalton, R. C., & 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 S. N. Dalton, H. Schnädelbach, M. Wiberg, & T. Varoudis (Eds.), *Architecture and Interaction: Human Computer Interaction in Space and Place* (pp. 17–35). doi: 10.1007/978-3-319-30028-3-2

[[pdf]]

the chapter has been used for teaching architecture students at ETH Zurich and National University Singapore.

peer-reviewed
conference
proceedings

Krukar, J., & Schwering, A. (2022). Are Psychological Variables Relevant to Evaluating Geoinformatics Applications? The Case of Landmarks (Vision Paper). In T. Ishikawa, S. I. Fabrikant, & S. Winter (Eds.), 15th International Conference on Spatial Information Theory (COSIT 2022) (Vol. 240, p. 10:1-10:13). Schloss Dagstuhl – Leibniz-Zentrum für Informatik. <https://doi.org/10.4230/LIPIcs.COSIT.2022.10>

[[pdf]] [[data]]

Schwering, A., **Krukar, J.**, Manivannan, C., Chipofya, M., & Jan, S. (2022). Generalized, Inaccurate, Incomplete: How to Comprehensively Analyze Sketch Maps Beyond Their Metric Correctness. In T. Ishikawa, S. I. Fabrikant, & S. Winter (Eds.), *15th International Conference on Spatial Information Theory (COSIT 2022)* (Vol. 240, p. 8:1-8:15). Schloss Dagstuhl – Leibniz-Zentrum für Informatik. <https://doi.org/10.4230/LIPIcs.COSIT.2022.8>
[[pdf]]

Kim, K. G., **Krukar, J.**, Mavros, P., Zhao, J., Kiefer, P., Schwering, A., Hölscher, C., & Raubal, M. (2022). 3D Sketch Maps: Concept, Potential Benefits, and Challenges. In T. Ishikawa, S. I. Fabrikant, & S. Winter (Eds.), *15th International Conference on Spatial Information Theory (COSIT 2022)* (Vol. 240, p. 14:1-14:7). Schloss Dagstuhl – Leibniz-Zentrum für Informatik. <https://doi.org/10.4230/LIPIcs.COSIT.2022.14>
runner-up best short paper
[[pdf]]

Löwen, H., **Krukar, J.**, & Schwering, A. (2019). Functional Scales in Assisted Wayfinding. In S. Timpf, C. Schlieder, M. Kattenbeck, B. Ludwig, & K. Stewart (Eds.), *Proceedings of the 14th International Conference on Spatial Information Theory (COSIT 2019)* (Vol. 142, pp. 3:1-3:7). doi: 10.4230/LIPIcs.COSIT.2019.3
[[pdf]]

Krukar, J., & Van Eek, A. (2019). The Impact of Indoor/Outdoor Context on Smartphone Interaction During Walking. In P. Kyriakidis, D. Hadjimitsis, D. Skarlatos, & A. Mansourian (Eds.), *Accepted Short Papers and Posters from the 22nd AGILE Conference on Geo-information Science*. Limassol, Cyprus: Stichting AGILE.
[[pdf]]

Krukar, J., Münzer, S., Lörch, L., Anacta, V. J., Fuest, S., & Schwering, A. (2018). Distinguishing Sketch Map Types: A Flexible Feature-Based Classification. In S. Creem-Regehr, J. Schöning, & A. Klippel (Eds.), *Spatial Cognition XI* (pp. 279–292). doi: 10.1007/978-3-319-96385-3_19
[[pdf]] [[code and data]]

Krukar, J., Schwering, A., Löwen, H., Galvao, M., & Anacta, V. J. (2018). Rethinking Wayfinding Support Systems—Introduction. In P. Fogliaroni, A. Ballatore, & E. Clementini (Eds.), *Proceedings of Workshops and Posters at the 13th International Conference on Spatial Information Theory (COSIT 2017)* (pp. 151–152). doi: 10.1007/978-3-319-63946-8_29
editorial to workshop proceedings
[[pdf]]

Krukar, J., Schultz, C., & Bhatt, M. (2017). Towards Embodied 3D Isovists. In T. Heitor, M. Serra, J. P. S. M. Bacharel, & L. C. da Silva (Eds.), *Proceedings of the 11th Space Syntax Symposium*. Lisbon: Instituto Superior Tecnico.
[[pdf]]

Löwen, H., Schwering, A., **Krukar, J.**, & Winter, S. (2017). Perspectives in Externalizations of Mental Spatial Representations. In A. Bregt, T. Sarjakoski, R. van Lammeren, & F. Rip (Eds.), *Societal Geo-innovation. AGILE 2017. Lecture Notes in Geoinformation and Cartography* (pp. 111–127). doi: 10.1007/978-3-319-56759-4_7

[[pdf]]

Anacta, V. J. A., Humayun, M. I., Schwering, A., & **Krukar, J.** (2017). Investigating Representations of Places with Unclear Spatial Extent in Sketch Maps. In A. Bregt, T. Sarjakoski, R. van Lammeren, & F. Rip (Eds.), *Societal Geo-innovation. AGILE 2017. Lecture Notes in Geoinformation and Cartography* (pp. 3–17). doi: 10.1007/978-3-319-56759-4_1

[[pdf]]

Padmanaban, R., & **Krukar, J.** (2017). Increasing the Density of Local Landmarks in Wayfinding Instructions for the Visually Impaired. In G. Gartner & H. Huang (Eds.), *Progress in Location-Based Services 2016* (pp. 131–150). doi: 10.1007/978-3-319-47289-8_7

publication developed from the student’s Master thesis (first author)

[[pdf]]

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

[[pdf]]

Krukar, J., & Conroy Dalton, R. (2013). Walk, Look, Remember: Art Galleries as Spaces Facilitating Memory. In Y. O. Kim, H. T. Park, & K. W. Seo (Eds.), *Proceedings of Ninth International Space Syntax Symposium* (pp. 074:1-19). Seoul: Sejong University Press.

[[pdf]]

extended
abstracts
and posters

Schwering, A., **Krukar, J.**, Seep, J., and Qamaz, Y. (2021). Individualization in Spatial Behaviour and Map Reading. *AGILE: GIScience Series*, 4, 41.

[[pdf]]

Schwering, A., and **Krukar, J.** (2021). A landmark’s role in spatial learning depends on its spatial extent. *Cognitive Processing*, 22, 28–28.

Krukar, J., Mavros, P., & Hoelscher, C. (2020). Towards capturing focal/ambient attention during dynamic wayfinding. *Symposium on Eye Tracking Research and Applications*, 1–5. doi: 10.1145/3379157.3391417

[[pdf]]

Dalton, R., Dalton, N., Hölscher, C., Veddeler, C., **Krukar, J.**, & Wiberg, M. (2020). HabiTech : Inhabiting Buildings, Data & Technology. *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems*, 1–8. doi: 10.1145/3334480.3375179

[[pdf]]

Schick, W., **Krukar, J.**, & Schwering, A. (2019). Functional verbal scales in route instructions of wayfinding assistance systems. *Speaking of Location (Workshop in conjunction with COSIT 2019)*. Regensburg, Germany.

[[pdf]]

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

[[pdf]]

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

[[pdf]]

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? *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. *The 21th AGILE International Conference on Geographic Information Science: AGILE 2018*, Lund, Sweden.

Krukar, J. (2017). Cognitively Sustainable Built Environments. *Annual Meeting of the American Association of Geographers*. Boston, USA.

Krukar, J., & Schwering, A. (2016). What is Orientation? In T. B. Barkowsky, Z. Falomir Llansola, H. Schultheis, & J. van de Ven (Eds.), *KogWis: 13th Biannual Conference of the German Cognitive Science Society* (pp. 115–117). Bremen, Germany.

[[pdf]]

Anacta, V., **Krukar, J.**, Humayun, M., & Schwering, A. (2016). Visualizing salient features in spatial descriptions. *European Workshop on Image and Cognition (EWIC)*. Paris, France.

[[pdf]]

Du, G., Lohoff, L., **Krukar, J.**, & Mukhametov, S. (2016). Comparing Two Methods to Overcome Interaction Blindness on Public Displays. *Proceedings of the 5th ACM International Symposium on Pervasive Displays*, 243–244. doi: 10.1145/2914920.2940339

publication developed from the students' course project

von Stülpnagel, R., Wächter, L., Holland, N., & **Krukar, J.** (2016). Subjective Risk Perception in Urban Cycling - Assessing The Validity of Opinion-Based Volunteered Geographic Information. *Vulnerable Road Users Symposium at the 57. Tagung Experimentell Arbeitender Psychologen*. Heidelberg, Germany.

Krukar, J., & von Stülpnagel, R. (2015). Adjusting for Cognitive and Spatial Biases of VGI: The Case of Perceived Risks in Urban Cycling. In H. Skov-Petersen (Ed.), *Human mobility, cognition and GISc*. Copenhagen, Denmark.

[[pdf]]

Conroy Dalton, R. and **Krukar, J.** (2014; equal contribution). Augmenting Intuitive Navigation at Local Scale. *Spatial Search Specialist Meeting*. Santa Barbara, USA.

Krukar, J. (2014). Cognitively Biased Agent-Based Models. In B. Emo, K. Al Sayed, & T. Varoudis (Eds.), *Design Cognition and Behavior: Usability in the Built Environment. Proceedings of the workshop held at Spatial Cognition 2014* (pp. 4–5). Bremen, Germany.

[[pdf]]

Krukar, J. (2014). Spontaneous Memory of Art Exhibitions: Explanations from Eye-Tracking. In C. Freksa, B. Nebel, M. Hegarty, & T. Barkowsky (Eds.), *Spatial Cognition 2014: Poster Presentations* (pp. 60–63). Bremen, Germany.

[[pdf]]

Krukar, J., & Conroy Dalton, R. (2012). Towards a Unified Model of Building Usability. *22nd International Association People-Environment Studies (IAPS) Conference*. Glasgow, UK.

[[pdf]]

reproducibility
reviews

Krukar, J. (2022). Reproducibility review of: Unlocking social network analysis methods for studying human mobility. <https://doi.org/10.17605/OSF.IO/MVQCW>

Krukar, J. (2022). Reproducibility review of: GeoXTag: Relative Spatial Information Extraction and Tagging of Unstructured Text. <https://doi.org/10.17605/OSF.IO/3G9S8>

Krukar, J. (2021). Reproducibility review of: A Socially Aware Huff Model for Destination Choice in Nature-based Tourism. *AGILE International Conference on Geographic Information Science 2021*. doi: 10.17605/OSF.IO/4CPM3

standalone
datasets

Schwering, A., & **Krukar, J.** (2022). A collection of Sketch Maps from the Spatial Intelligence Lab. <https://doi.org/10.17605/OSF.IO/U4KV2>