

**Tyler Thrash**  
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Current positions:

Fellow for the Digital Society Initiative –  
University of Zurich (03/18 – present)

Postdoctoral researcher in Geographic Information Visualization and Analysis -  
University of Zurich (11/17 – present)

Postdoctoral researcher in Cognitive Science -  
ETH Zürich (6/13 – present)

Education

- Graduate School: Department of Psychology, Miami University, Oxford, Ohio, USA
  - Doctor of Philosophy (2013)
  - Masters of Arts (2011)
  - Cumulative GPA = 3.58 / 4.00
  - Area: Brain & Cognitive
- College: University of Dayton, Dayton, Ohio, USA
  - Bachelor of Science (2008)
  - Cumulative GPA = 3.4 / 4.0
  - Major: Psychology; Minor: Biology

Teaching experience

- Cognition in Architecture: Designing Orientation and Navigation for Building Users (9/13-12/17) – ETH Zürich
  - Co-instructor
- Introduction to Cognitive Science (9/13-12/17) – ETH Zürich
  - Co-instructor
- HCI at ETH Zürich: An Applied Cognitive Science Perspective (9/15-12/15 & 9/17-12/17) - Universität Basel
  - Co-instructor
- Applied Cognitive Science (2/14-5/16) – ETH Zürich
  - Co-instructor
- Cognitive Psychology (6/12-8/12) – Miami University - Hamilton
  - Instructor

- Statistics and Research Methods Laboratory (1/12-5/12) – Miami University
  - Instructor
- Research Methods Laboratory (8/11-12/11) – Miami University
  - Instructor
- Introduction to Psychological Statistics Laboratory (1/10 – 5/10 & 1/11 – 5/11) – Miami University
  - Instructor
- Introduction to Psychological Statistics (1/10 – 5/10 & 1/11 – 5/11) – Miami University
  - Teaching assistant
- Developmental Psychology (8/10-12/10) – Miami University
  - Teaching assistant
- Research Methods (1/10-5/10) – Miami University
  - Teaching assistant
- Introduction to Perception (8/09-12/09) – Miami University
  - Teaching assistant

#### Academic awards

- Student Travel Award (7/14) – Society for Mathematical Psychology
- Student Travel Award (7/13) – Society for Mathematical Psychology
- Graduate Assistantship (8/08 – 5/13) – Miami University
- Spatial Cognition Stipend (8/10) – Spatial Intelligence and Learning Center, Transregional Collaborative Research Center
- Psi Chi Travel Award (5/08) – University of Dayton
- Roesch Research Fellowship (8/07 – 5/08) – University of Dayton
- Dean’s List (8/06 – 5/07 & 1/08 – 5/08) – University of Dayton
- President’s Merit Scholarship (5/04 – 5/08) – University of Dayton

#### Other work experience

- Office of Institutional Research (8/10 – 10/12; part-time) – Oxford, OH
  - Survey proctor; administered Collegiate Learning Assessment and Cooperative Institutional Research Program

- Howe Writing Center (8/11 – 10/11; part-time) – Oxford, OH
  - Data analysis assistant; assisted with survey analysis and interpretation

#### Grant contributions

- ENERGYSCAPE: Landscape strategy for renewable energy systems
  - Submitted October 2016 to the Swiss National Science Foundation
  - Contributed as co-author
  - Funded approximately \$500,000
  - Principle investigator: Adrienne Gret-Regamey
- A Cognitive Science Approach to Evidence-Based Design Using Virtual Reality
  - Submitted September 2016 to ETH Zurich Research Grants
  - Contributed as co-author
  - Funded approximately \$225,000
  - Principle investigator: Victor Schinazi
- Plant spatial memory: The influence of previous experience on plant growth patterns
  - Submitted July 2016 to the Swiss National Science Foundation
  - Contributed as principle investigator
  - Funded approximately \$9,000
- WiSE: Wayfinding in Social Environments
  - Submitted April 2015 to the Swiss National Science Foundation
  - Contributed as co-author
  - Funded approximately \$360,000
  - Principle investigator: Christoph Hoelscher
- FCL2: Cognition, Perception, and Behaviour in Urban Environments
  - Submitted July 2014 to Singapore's National Research Foundation
  - Contributed as a co-author
  - Funded approximately \$1,500,000
  - Principle investigator: Christoph Hoelscher

#### Full-length publications

- Schinazi, V. & Thrash, T. (in press). Cognitive neuroscience of spatial and geographic thinking. In D. Montello (ed.) *Handbook of Cognitive and Behavioral Geography*.
- Dubey, R., Kapadia, M., Thrash, T., Schinazi, V.R., & Hoelscher, C. (2017). Towards an information-theoretic framework for quantifying wayfinding information in virtual environments. *Proceedings of the Cognition and Artificial Intelligence for Human-Centered Design Workshop*.

- Gruebel, J., Thrash, T., Hoelscher, C., & Schinazi, V.R. (2017). Evaluation of a conceptual framework for predicting navigation performance in virtual reality. *PLOS ONE*.
- Hoelscher, C., Schinazi, V., Thrash, T., & Zacharias, J. (2017). Theoretical and methodological challenges for cognitive research in the built environment. In S. Cairns & D. Tunas (eds.) *Future Cities Laboratory: Indicia 1*.
- Moussaïd, M., Kapadia, M., Thrash, T., Sumner, R.W., Gross, M., Helbing, D., & Hoelscher, C. (2016). Crowd behavior during high-stress evacuations in an immersive virtual environment. *Journal of the Royal Society Interface*, 13.
- Schinazi, V., Thrash, T., & Chebat, D. (2016). Spatial navigation by congenitally blind individuals. *WIREs Cognitive Science*, 7, 37-58.
- Thrash, T., Kapadia, M., Moussaïd, M., Wilhelm, C., Helbing, D., Sumner, R.W., & Hoelscher, C. (2015). Evaluation of control interfaces for desktop virtual environments. *Presence: Teleoperators and virtual environments*, 24, 322-334.
- Kuliga, S., Thrash, T., Dalton, R.C., & Hoelscher, C. (2015). Virtual reality as an empirical research tool – Exploring user experience in a real building and a corresponding virtual model. *Computers, Environment and Urban Systems*.
- Thrash, T., & Barisic, I. (2014). Spatiotemporal windows for fixation detection. *Proceedings of the 2<sup>nd</sup> International Workshop on Eye Tracking for Spatial Research*.
- Giannopoulos, I., Kiefer, P., Raubal, M., Richter, K. F., & Thrash, T. (2014). Wayfinding decision situations: A conceptual model and evaluation. *Proceedings of the Eighth International Conference on Geographic Information Science*.
- Thrash, T., Giannopoulos, I., & Schinazi, V. (2014). Bidimensional regression: Issues with interpolation. *Proceedings of the 36<sup>th</sup> Annual Meeting of the Cognitive Science Society*.
- Hodgson, E., Bachmann, E., & Thrash, T. (2014). Performance of redirected walking algorithms in a constrained virtual world. *IEEE Transactions on Visualization and Computer Graphics*, 20, 579-587.
- Friedman, A., Waller, D., Thrash, T., Greenauer, N., & Hodgson, E. (2011). View combination: A generalization mechanism for visual recognition. *Cognition*, 119, 229-241.

## Presentations and Posters

- Crede, S., Fabrikant, S., Thrash, T., & Hoelscher, C. (September 2017). Do skyscrapers facilitate spatial learning under stress? On the cognitive processing of global landmarks. *Poster presentation for the Conference on Spatial Information Theory*, L'Aquila, Italy.
- Barisic, I., Thrash, T., Schinazi, V., & Hoelscher, C. (July 2017). Social wayfinding. *Poster presentation for the annual meeting of the Cognitive Science Society*, London, UK.
- Thrash, T., Hoffman, M., Kapadia, M., Hoelscher, C., & Schinazi, V. (July 2017). Investigations of collective search behavior using virtual reality and agent-based simulations. *Presentation for a lecture series at the Future Cities Laboratory*, Singapore.
- Oberholzer, Y., Thrash, T., Giannopoulos, I., Hoelscher, C., & Schinazi, V. (June 2017). Does GPS rot your brain? An empirical investigation of spatial knowledge acquisition with GPS. *Poster presentation for the Urban Wayfinding and the Brain Workshop*, London, UK.
- Thrash, T., Zhao, H., Duran, A., Frese, L., & Schinazi, V.R. (April 2017). Evaluation of a computational framework for cognitive maps. *Invited presentation for the International Workshop on Models and Representations in Spatial Cognition*, Tuebingen, Germany.
- Gruebel, J., Thrash, T., Schinazi, V.R., & Hoelscher, C. (September 2016). The decomposition of navigation behavior into simple tasks. *Presentation at the bi-annual conference of the German Cognitive Science Society*, Bremen, Germany.
- Schinazi, V.R., Thrash, T., O'Gorman Tuura, R., Hoelscher, C., & Hasler, G. (August 2016). Hemisphere-specific variation in caudate and hippocampus volume during response and spatial learning. *Poster session presented at the bi-annual Spatial Cognition Conference*, Philadelphia, PA, USA.
- Emo, B., Thrash, T., Schinazi, V.R., & Hoelscher, C. (August 2016). Wayfinding in unfamiliar environments: Report of a real-world study using eye tracking. *Poster session presented at the bi-annual Spatial Cognition Conference*, Philadelphia, PA, USA.
- Thrash, T. (March 2016). Formalizing the cognitive map. *Invited presentation for the International Workshop on Models and Representations in Spatial Cognition*, Delmenhorst, Germany.
- Thrash, T. & Waller, D. (November 2015). On the origin of the default categorical structure in spatial memory. *Poster session presented at the annual meeting of the Psychonomics Society*, Chicago, IL, USA.

- Thrash, T. (November 2015). Assessing chance performance of the Category-Adjustment Model. *Poster session presented at the Computational Approaches to Cognition Symposium*, Chicago, IL, USA.
- Gruebel, J., Schinazi, V. R., Thrash, T., & Hoelscher, C. (July 2014). Understanding the relationship between human interface devices and spatial abilities in virtual environments. *Presentation for the annual meeting of the Association of American Geographers*, Tampa, FL, USA.
- Thrash, T., Schinazi, V., Barisic, I., Emo, B., & Hoelscher, C. (May 2014). Stress and restoration during navigation through an urban environment. *Presentation for the Digital Landscape Architecture conference*, Zurich, Switzerland.
- Thrash, T., & Thomas, R. (August 2013). Comparing parameter estimation techniques. *Poster session presented at the annual meeting of the Society for Mathematical Psychology*, Potsdam, Germany.
- Thrash, T. & Waller, D. (February 2013). Plant spatial memory. *Presentation for lecture series in the Brain & Cognitive area*, Miami University, Oxford, OH.
- Thrash, T. & Waller, D. (April 2012). On the origin of the default categorical structure. *Presentation for lecture series in the Brain & Cognitive area*, Miami University, Oxford, OH.
- Thrash, T. & Waller, D. (November 2011). Categorical bias in enduring representation emerges from object movement. *Poster session presented at the annual meeting of the Psychonomics Society*, Seattle, WA.
- Thrash, T. & Waller, D. (February 2011). Categorical bias in transient and enduring spatial representation. *Presentation for lecture series in the Brain & Cognitive area*, Miami University, Oxford, OH.
- Thrash, T., Waller, D., & Friedman, A. (November 2010). Enhanced prototypes in scene recognition are not necessarily extreme category members. *Poster session presented at the annual meeting of the Psychonomics Society*, St. Louis, MO.
- Thrash, T. & Waller, D. (August 2010). Categorical bias in transient and enduring spatial representation. *Poster session presented at the bi-annual Spatial Cognition conference*, Mt. Hood/Portland, OR.
- Thrash, T., Waller, D., Friedman, A., Hodgson, E., & Greenauer, N. (October 2009). Prototypes and scene memory. *Presentation for lecture series in the Brain & Cognitive area*, Miami University, Oxford, OH.

- Greenauer, N., Waller, D., Mello, C., & Thrash, T. (November 2009). Micro- and macro-reference frames: Specifying hierarchical spatial relations in memory. *Poster session presented at the annual meeting of the Psychonomics Society*, Boston, MA.
- Thrash, T. & Davis, S. (September 2008). Embodiment and mental rotation. *Presentation for lecture series in the Brain & Cognitive area*, Miami University, Oxford, OH.
- Thrash, T. & Davis, S. (May 2008). Embodiment and mental rotation. *Poster session presented at the annual meeting of the Midwestern Psychological Association*, Chicago, IL.
- Thrash, T. & Davis, S. (April 2008). Embodiment and mental rotation. *Presentation at the Butler Undergraduate Research Conference*, Indianapolis, IN.
- Thrash, T. & Davis, S. (April 2008). Embodiment and mental rotation. *Poster session presented at the Stander Symposium*, University of Dayton, Dayton, OH.
- Hentz, J., Thrash, T., & Davis, S. (April 2008). Memory for location. *Poster session presented at the Stander Symposium*, University of Dayton, Dayton, OH.
- Thrash, T. & Davis, S. (December 2007). Embodiment and mental rotation. *Poster session presented at the Social & Behavioral Sciences Symposium*, University of Dayton, Dayton, OH.

#### Other academic activities

- Co-organizer of “Models and representations in spatial cognition workshop (September 2018). *Spatial Cognition Conference*, Tuebingen, Germany.”
- Co-organizer of “Cognitive engineering for spatial information processes: From user interfaces to model-driven design (October 2015). *Conference on Spatial Information Theory*, Santa Fe, NM, USA.”
- Co-supervised theses
  - Gruebel, J. (completed 2018). A cognitive model for routing in agent-based modelling, *Master’s Thesis for the Institute of Science, Technology, and Policy at ETH Zurich*.
  - Collazo, J. (completed 2017). Social wayfinding and simulations in networked virtual reality, *Bachelor’s Thesis for the Department of Computer Science at ETH Zurich*.
  - Frese, L. (completed 2017). Reference frame selection and different spatial learning profiles, *Master’s Thesis for the Department of Psychology at the University of Basel*.
  - Zhao, H. (completed 2016). Crowd simulation and virtual reality experiments for 2010 Love Parade Disaster, *Master’s Thesis for the Chair of Computational Social Science at ETH Zurich*.

- Hoffman, M. (completed 2016). Virtual reality experiments and simulations for the design of innovative infrastructures, *Master's Thesis for the Department of Computer Science at Supelec Paris*.
- Jiang, M. (completed 2016). Real-time gaze interaction in a MiddleVR/Unity-based CAVE, *Semester Thesis for the Department of Electrical Engineering at ETH Zurich*.
- Wilhelm, C. (completed 2014). Human interactions in networked virtual environments, *Master's Thesis for the Department of Computer Science at ETH Zurich*.
- Ad-hoc reviewer for
  - IEEE Transactions on Human-Machine Systems
  - International Journal of Geo-information
  - Cognition
  - Cognitive Science
  - Journal of Experimental Psychology: Learning, Memory, and Cognition
  - Spatial Cognition and Computation
  - Cognitive Processing
  - Memory & Cognition
  - Journal of Classification
  - Attention, Perception, & Psychophysics
  - Kuenstliche Intelligenz
  - Forest Policy and Economics
  - International Journal of Design, Creativity, and Innovation
  - Human Behavior in Design Conference
  - IEEE Virtual Reality Conference
  - Spatial Cognition Conference
  - Conference on Spatial Information Theory
- Review board member for the Decision Sciences Laboratory at ETH Zürich