Trenton D. Wirth

Curriculum Vitae

Email: wirthtd@ucmail.uc.edu

Employment

Assistant Professor, Educator

University of Cincinnati, Department of Psychology
Cincinnati, Ohio, USA

Co-Founder of The FreeMoCap Foundation

The FreeMoCap Foundation (2021-present)
Boston, Massachusetts, USA

Post-Doctoral Researcher

Human Movement Neuroscience Lab (2020-2023)
Northeastern University, Department of Biology
Boston, Massachusetts, USA

Graduate Student Researcher

Virtual Environment Navigation Lab (2014-2021)
Brown University, Department of Cognitive, Linguistic and Psychological Sciences
Providence, Rhode Island, USA

Education

Graduate

Ph.D., Cognitive Science (2021)
Brown University, Department of Cognitive, Linguistic and Psychological Sciences

Thesis: *Self-Organization in Human Crowds: The Transition from Averaging to Competition*
Advisor: Dr. William Warren

Undergraduate

B.S. Psychology, *Cum Laude* (2014)
B.A. Philosophy, *Summa Cum Laude* (2014)
University of Cincinnati, College of Arts & Sciences
Thesis: Postural Facilitation of Auditory Localization
Advisor: Dr. Michael Riley

Research Interests

- Visual Control of Locomotion
- Perception and Action in Augmented & Virtual Reality
- Navigation
- Behavioral Dynamics
- Natural Eye Movements

Publications

1. **Wirth, T. D.**, Dachner, G. C., Rio, K. W., & Warren, W. H. (2023). Is the neighborhood of interaction in human crowds metric, topological, or visual?. *PNAS nexus*, *2*(5), pgad118.

2. Warren, W. H., Falandays, J. B., Yoshida, K., **Wirth, T. D.**, & Free, B. A. (2023). Human crowds as social networks: collective dynamics of consensus and polarization. *Perspectives on Psychological Science*, 17456916231186406.

3. Dachner, G.C., **Wirth, T.D.**, Richmond, E., & Warren, W.H. (2022). A visual model of collective motion in human crowds. *Proceedings of the Royal Society B*, *289*(1970), 20212089.

4. **Wirth T.D.** & Warren W.H. (2021). Robust weighted averaging accounts for recruitment into collective motion in human crowds. *Frontiers Applied Math & Statistics:* 73.

5. Weast-Knapp, J. A., Shockley, K., Riley, M. A., Cummins-Sebree, S., Richardson, M. J., **Wirth, T. D.**, & Haibach, P. C. (2019). Perception of another person's maximum reach-with-jump height from walking kinematics. Quarterly Journal of Experimental Psychology.

6. Kinateder, M., **Wirth, T. D.**, & Warren, W. H. (2018). Crowd dynamics in virtual reality. In *Crowd Dynamics, Volume 1* (pp. 15-36). Birkhäuser, Cham.

Manuscripts Under Review, in Revision, or in Preparation

7. **Wirth T.D.**, Taylor, H., Free, B.A., & Warren W.H. (in prep). Decision-Making in Human Crowds: Nonlinear Competition Dynamics.

Presentations

Conference Talks

1. **Wirth, T.D.,** Reinhart, S.E., Nguyen, M. & Matthis, J.S., (2022). Terrain complexity and the relationship between gaze and foot placement. Dynamic Walking, Madison Wisconsin, June, 2022.
2. **Wirth, T.D.** & Matthis, J.S., (2022) Terrain complexity and the relationship between gaze and locomotion. Vision Sciences Society, St. Pete's Beach Florida, May, 2022.
3. **Wirth, T.D.** & Warren, W.H., (2019). *Collective Decision Making in Human Crowds: Majority Rule Emerges From Local Averaging.* Vision Sciences Society, St. Pete's Beach Florida, May, 2019.

Workshops

1. **Wirth, T.D.** (2024). *"AI Chatbots - The Every Day Pocket Professor*. LT@UC, UC Clermont, Batavia Ohio, May 22, 2024.

Poster Presentations

2. Warren, W.H. & **Wirth, T.D.** (2022). A Bifurcation in Visually-Guided Behavior When Following a Crowd. Vision Sciences Society, St. Petes Beach Florida, May 16, 2022.
3. Cherian, A.T., **Wirth, T.D.**, Hartigan, K., Queen, P., & Matthis, J.S. *Validating the FreeMoCap Markerless Motion Capture System Using a Balance Assessment Task.* Rocky Mountain Regional American Society of Biomechanics, Estes Park Colorado, April, 2022.
4. **Wirth, T.D.**, Free, B.A., & Warren, W.H., (2021). *Decision-Making in Human Crowds: Nonlinear Competition Dynamics.* Virtual Vision Sciences Society, May 22, 2021.
5. **Wirth, T.D.**, Dachner, G.C., & Warren, W.H., (2018). *Metric vs. topological models of collective motion in human crowds.* Vision Sciences Society, St. Pete's Beach Florida, May 18-23, 2018.
6. **Wirth, T.D.**, Warren, W.H., (2017). *Recruitment of pedestrians into collective crowd motion.* Pedestrian Dynamics: Modeling, Validation and Calibration at ICERM, Providence, RI,

August 21-25, 2017.

7. **Wirth, T.D.**, Warren, W.H., (2017). *Recruitment of pedestrians into collective crowd motion.* Vision Sciences Society, St. Pete's Beach Florida, May 19-24, 2017.
8. **Wirth, T.D.,** Warren, W.H., (2016). *The visual neighborhood in human crowds: Metric vs. topological hypothesis.* Vision Sciences Society, St. Pete's Beach Florida, May 13-18, 2016.
9. **Wirth, T.D.**, Lucas, J., Médé, B., Bonnette, S., & Riley, M.A. (2014) *Role of postural facilitation in auditory localization tasks.* Presented at North American International Society for Ecological Psychology Meeting, Oxford Ohio, June 5-7, 2014.

Other Presentations

10. Warren, W.H., Dachner, G.C., & **Wirth, T.D.** (2020) A visual model of collective motion in human crowds. Invited plenary lecture, Workshop on Collective Information Processing, Humboldt University, Berlin.
11. **Wirth, T.D.** & Warren W.H. (2015) Metric vs. Topological Neighborhoods in Human Crowds, First Year Project Presentation, Brown University, Providence RI.

Teaching Experience

Lecturer of Record

University of Cincinnati, Department of Psychology

Semester, Year	Course name	Course Number	Class Size	Credit Hours
Fall, 2023	Research Methods & Statistics I (Laboratory)	PSYC2001C	63	4
Fall, 2023	Research Capstone: Cognitive Psychology	PSYC5057	4	3
Fall, 2023	Non-Clinical Grad Practicum	PSYC8096	10	1-12
Spring, 2024	Research Methods & Statistics I (Laboratory)	PSYC2001C	75	4
Spring, 2024	Research Capstone: Cognitive Psychology	PSYC5057	15	3
Spring, 2024	Non-Clinical Grad Practicum	PSYC8096	8	1-12
Spring, 2024	Teaching Practicum	PSYC2096	3	1-3
Spring, 2024	Sensation & Perception	PSYC2030	98	3

Semester, Year	Course name	Course Number	Class Size	Credit Hours
Summer, 2024	Cognitive Science	PSYC3025	11	3
Fall, 2024	Research Methods & Statistics II (Laboratory)	PSYC2002C	83	4
Fall, 2024	Research Capstone: Cognitive Psychology	PSYC5057	15	3
Fall, 2024	Non-Clinical Grad Practicum	PSYC8096	10	1-12
Fall, 2024	Teaching Practicum	PSYC2096	3	1-3
Fall, 2024	Programming for Behavioral Scientists	PSYC3010	35	3
Spring, 2025	Research Methods & Statistics I (Laboratory)	PSYC2001C	72	4
Spring, 2025	Research Capstone: Cognitive Science & AI	PSYC5063	5	3
Spring, 2025	Non-Clinical Grad Practicum	PSYC8096	7	1-12
Spring, 2025	Teaching Practicum	PSYC2096	5	1-3

Guest Lecturer

Northeastern University, Brown University

Semeseter, Year	Description
Fall, 2021	"Self-organized Animal Collective Motion", Locomotion, Northeastern University, Department of Biology
Spring, 2020	"Embodied Perception", Dynamics in Perception & Action, Brown University, Department of Cognitive, Linguistic and Psychological Sciences
Spring, 2018	"Sensation", Human Cognition, Brown University, Department of Cognitive, Linguistic and Psychological Sciences
Spring, 2018	"Perception", Human Cognition, Brown University, Department of Cognitive, Linguistic and Psychological Sciences
Spring, 2017	"Perception", Elementary Psychology, Brown University, Department of Cognitive, Linguistic and Psychological Sciences
Fall, 2016	"Affordances", Dynamics in Perception & Action, Brown University, Department of Cognitive, Linguistic and Psychological Sciences

Semeseter, Year	Description
Fall, 2016	"Animal Collective Behavior", Social Cognition Lab, Brown University, Department of Cognitive, Linguistic and Psychological Sciences

Teaching Assistant

Brown University

Semester, Year	Description
Spring, 2018	Teaching Assistant, Human Cognition, Brown University, Department of Cognitive, Linguistic and Psychological Sciences
Spring, 2017	Teaching Assistant, Elementary Psychology, Brown University, Department of Cognitive, Linguistic and Psychological Sciences
Fall, 2016	Teaching Assistant, Intro to Cognitive Science, Brown University, Department of Cognitive, Linguistic and Psychological Sciences
Fall, 2016	Teaching Assistant, Social Cognition Lab, Brown University, Department of Cognitive, Linguistic and Psychological Sciences

Grants, Fellowships, and Awards

Received

- Epic MegaGrant, March 2022 -- $15,000, The FreeMoCap Foundation
- Link Foundation Fellowship: Modeling Simulation & Training, 2019 -- $29,500
- Hyundai Visionary Challenge, Brown University (Fall 2018) Award Recipient - Pedestrians to Pilots: using virtual reality as a tool for 3D human navigation
- Research Assistant of the Year, Psychology Department University of Cincinnati, 2014

Submitted

- University of Cincinnati Pilots Collaboration Grant, Fall 2024 -- $25,000, Title: Behavioral Dynamics of Retinal Optic Flow.
- NIH F32, August 2020 -- $194,790.00, Title: Determining the influence of biomechanics on visual search for footholds during locomotion over complex terrain

Certifications

- 2016-17 Sheridan Teaching Certificate I, The Harriet W. Sheridan Center for Teaching and Learning, Brown University
- 2019 Brown Ethics and Responsible Conduct of Research Certificate, Office of Research Integrity, Brown University