

Dr. Benjamin Wolfe
University of Toronto Mississauga
Department of Psychology
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PROFESSIONAL APPOINTMENTS

- 2021 - Assistant Professor
Department of Psychology, University of Toronto Mississauga
Cross-appointed, Faculty of Arts and Sciences, Psychology, University of Toronto
Co-Director, Applied Perception and Psychophysics Lab (APPLY Lab)
- 2016 - 2020 Postdoctoral Associate, Rosenholtz Lab
Department of Brain and Cognitive Sciences
Massachusetts Institute of Technology
PI: Dr. Ruth Rosenholtz
- 2015 – 2016 Postdoctoral Associate, AgeLab
Center for Transportation Logistics
Massachusetts Institute of Technology
PIs: Dr. Bryan Reimer and Bruce Mehler

EDUCATION

- 2015 Ph.D., Psychology
University of California at Berkeley
Advisor: Professor David Whitney; Cognition, Brain and Behavior Program
Dissertation: *Before the Eye Moves: Remapping, Visual Stability and Perisaccadic Perception*
- 2008 B.A., Psychology
Boston University

RESEARCH INTERESTS

Visual perception; peripheral vision, scene perception, eye movements, visual attention, driving

GRANTS AND FELLOWSHIPS

- 2020 Adobe Research Award
Virtual Reading Laboratory Project
\$40,000 CAD, gift award to APPLY Lab
- 2019 – 2020 Toyota Research Institute -CSAIL Joint Research Program Grant
“Driver Perception and the Car-to-Driver Handoff”
PI: Rosenholtz, supporting Benjamin Wolfe
\$230,000 per year in direct support to Rosenholtz Lab

- 2016 – 2018 Toyota Research Institute-CSAIL Joint Research Program Grant
 “Reducing the Pain Points in Driving”
 PI: Rosenholtz; supporting Benjamin Wolfe
\$300,000 per year in direct support to Rosenholtz Lab
- 2017 Transport Research Laboratories (via CSAIL Alliances)
 “Critical Event Response Thresholds”
\$20,000 (gift award)
- 2015 Google Faculty Research Award
 “The role of eye movements in successful navigation during smartphone use”
 PI: Rosenholtz
\$67,000 (gift award)
- 2011 – 2014 Graduate Research Fellowship (GRFP) to Benjamin Wolfe
 National Science Foundation
\$120,000 in direct support and tuition coverage
- 2005 – 2008 Undergraduate Research Opportunities Program (UROP)
 Boston University; 8 Competitive Renewals
\$20,000 in direct support over three years

AWARDS AND HONORS

- 2018 Transportation Review Board; Operations Section Young Author Award
- 2015, 2014 UC Berkeley Research Impact Initiative (Open Access Publication)
- 2015 UC Berkeley Psychology Department Travel Award
- 2014, 2013 UC Berkeley Graduate Division Travel Award

PUBLISHED PAPERS AND ARTICLES

- (2020) **Wolfe, B. A.**, Sawyer, B., Rosenholtz, R., Towards a Theory of Visual Information Acquisition in Driving. *Human Factors*.
- (2020) Sawyer, B., **Wolfe, B.**, Dobres, J., Chahine, N., Mehler, B., Reimer, B., Glancable Legible Typography over Complex Backgrounds. *Ergonomics*.
- (2019) **Wolfe, B. A.**, Seppelt, B., Mehler, B., Reimer, B., Rosenholtz, R., Rapid Detection and Localization of Road Hazards. *Journal of Experimental Psychology: General*.
- (2019) **Wolfe, B. A.**, Sawyer, B., Kosovicheva, A., Reimer, B., Rosenholtz, R., Detection of Brake Lights While Distracted: Separating Peripheral Vision from Cognitive Load. *Attention, Perception and Psychophysics*.
- (2019) **Wolfe, B. A.**, Fridman, L., Kosovicheva, A., Seppelt, B., Mehler, B., Reimer, B., Rosenholtz, R., Predicting Road Events from Brief Views of Driving Video. *Journal of Vision*. 19(5), 8-8
- (2018) **Wolfe, B.A.**, Rosenholtz, R., Peripheral Vision, Models Of. *Encyclopedia of Cognitive Neuroscience*.
- (2018) Dobres, J., **Wolfe, B.**, Chahine, N., Reimer, B. The Effects of Visual Crowding, Text Size, and Positional Uncertainty on Text Legibility at a Glance. *Applied Ergonomics*. 70, 240-246
- (2018) Chen, Z., Kosovicheva, A., **Wolfe, B.**, Cavanagh, P., Gorea, A., Whitney, D. Unifying Visual Space Across the Right and Left Hemifields. *Psychological Science*. 9(3), 356-369

(2017) **Wolfe, B.A.**, Dobres, J., Rosenholtz, R., & Reimer, B. More Than the Useful Field: Considering Peripheral Vision in Driving. *Applied Ergonomics*. 65, 316-325

(2017) **Wolfe, B.**, Fridman, L., Kosovicheva, A., Seppelt, B., Mehler, B., Reimer, B. Perceiving The Roadway In The Blink Of An Eye – Rapid Perception Of The Road Environment And Prediction Of Events. *Conference Proceedings, Driving Assessment 2017*.

(2017) Dobres, J., Chrysler, S. T., **Wolfe, B.**, Chahine, N., & Reimer, B. Signs of the Times: An Empirical Assessment of the Legibility of Highway Gothic and Clearview Signage Fonts. In *Transportation Research Board 96th Annual Meeting* (No. 17-04920). *Won Operations Section Young Author Award from Transportation Review Board*.

(2016) **Wolfe, B.**, Dobres, J., Kosovicheva, A., Rosenholtz, R., Reimer, B., Age-related differences in the legibility of degraded text. *Cognitive Research: Principles and Implications*. 1(1), 22

(2015) **Wolfe, B. A.**, Whitney, D. Saccadic remapping of object-selective information. *Attention, Perception and Psychophysics*. 77:7, 2260-2269.

(2015) **Wolfe, B. A.**, Kosovicheva, A. A., Leib, A. Y., Wood, K. Whitney, D. Foveal input is not required for ensemble perception of emotional faces. *Journal of Vision*. 15(4), 11-11.

(2014) Kosovicheva, A. A., **Wolfe, B. A.**, Whitney, D. Visual motion shifts saccade targets. *Attention, Perception, & Psychophysics*, 1-11.

(2014) **Wolfe, B. A.**, Whitney, D. Facilitating recognition of crowded faces with presaccadic attention. *Frontiers in Human Neuroscience*. 8:103

(2010) **Wolfe, B.A.**, Rushmore, R.J., Valero-Cabre, A. Coping With Spatial Attention in Real Space: A Low-Cost Portable Testing System for the Investigation of Visuo-Spatial Processing in the Human Brain. *Journal of Neuroscience Methods*. 187(2):190-8.

(2010) Swisher, J.D., Gatenby, J.C., Gore, J.C., **Wolfe, B.A.**, Moon, C.H., Kim, S.G., Tong., F.. Multiscale pattern analysis of orientation-selective activity in the primary visual cortex. *Journal of Neuroscience*. 30(20):6811-2.

MANUSCRIPTS IN REVIEW

Vater, C., **Wolfe, B.A.**, Rosenholtz, R., Peripheral vision in action: A systematic review on functionality discussions in driving, walking and aviation – a relation to sports

MANUSCRIPTS IN PREPARATION

Wolfe, B.A., Kosovicheva, A., Stent, S., Rosenholtz, R., Effects of Temporal and Spatiotemporal Cues on Detection of Dynamic Road Hazards.

Sawyer, B., **Wolfe, B. A.**, Dobres, J., The Science of Style: Design Guidelines for Legible Typography in Conventional and Augmented Reality (AR) Interface

Kosovicheva, A., **Wolfe, B. A.**, Whitney, D., Position representations for action lead perception: Evidence from saccades to drifting Gabor targets

TEACHING EXPERIENCE

- Spring 2015 *Mind, Brain and Behavior*, Graduate Student Instructor
 Departments: Psychology; Molecular and Cellular Biology
 Average student evaluation: 5.97 (department mean, 5.92 / 7)
- Spring 2011 *Sensation and Perception*, Graduate Student Instructor
 Department: Psychology
 Average student evaluation: 6.33 (department mean, 6.27 / 7)
- Fall 2010 *Drugs and the Brain*; Graduate Student Instructor
 Departments: Psychology and Molecular/Cell Biology
 Average student evaluation: 6.09 (department mean, 6.32 / 7)

MENTORING EXPERIENCE

- 2017 Sohan Subhash, High School Student in Rosenholtz Lab
- 2017 Yrvine Thelusma, High School Student in Rosenholtz Lab
- 2015 Martin A Lopez, MIT, Aeronautics and Astronautics Undergraduate
 Completed Senior Project in AgeLab
- 2015 Riley Ledezma, MIT, Aeronautics and Astronautics Undergraduate
 Completed Senior Project in AgeLab
- 2013-2015 Katherine Wood, Undergraduate Student, UC Berkeley
 Completed Honors Thesis in Psychology
- 2013 Omead Kohanteb, Undergraduate Student, UC Berkeley
- 2012 Claire Jeon, Undergraduate Student, UC Berkeley

SERVICE

- 2018 – Present Vision Sciences Society Demo Night Committee Member
- 2017 – 2020 Member, Ad-Hoc Working Group on NIH Clinical Trials Policy for Basic Science

ADDITIONAL TRAINING

- 2008 - 2010 Research Associate, Tong Lab
 Department of Psychology, Vanderbilt University
 Supervisor: Dr. Frank Tong
- 2005 – 2008 Research Assistant, Cerebral Dynamics Laboratory
 Department of Anatomy and Neurobiology, Boston University Medical School
 Advisors: Dr. R. Jarrett Rushmore and Dr. Antoni Valero-Cabré

REVIEWING EXPERIENCE

Journals: Attention, Perception and Psychophysics; Vision Research; Journal of Vision; Journal of Experimental Psychology: General; iPerception; Translational Vision Science and Technology; Visual Cognition, Cognitive Science; Experimental Psychology; Cognitive Research, Principles and Implications; Scientific Reports (Nature); PLOSone; Human Factors; Ergonomics; Applied Ergonomics; International Journal of Occupational Safety and Ergonomics; Traffic, Injury and Prevention; Accident, Analysis and Prevention; Transactions on Intelligent Transportation Systems

Conferences: IEEE Visualization and Graphics Technical Committee (VGTC), Driving Assessment, IEEE Information Visualization (InfoVis), NeurIPS/NIPS, AutomotiveUI

Agencies: US-Israel Binational Science Foundation

EDITORIAL EXPERIENCE

2021 – Digital Associate Editor, Psychonomics Society

COMMUNITY OUTREACH AND PRESENTATIONS

2010 – 2015 Whitney Lab K-12 Outreach Program

2014 Vision Sciences Society Demo Night Presenter, “Strobwheel”

2012 Vision Sciences Society Demo Night Presenter, “An Aftereffect Based on Texture Element Ratios”

GUEST LECTURES AND INVITED TALKS

(2021) Cueing the Driver: Temporal and Spatiotemporal Cues to Road Hazards
Human Factors Interest Group (HFIG), University of Toronto
February 12, 2021 *Given remotely due to COVID-19*

(2020) What can driving teach us about vision?
Boston University, Department of Biomedical Engineering
November 9, 2020 *Given remotely due to COVID-19*

(2020) How do drivers acquire visual information?
University of Toronto, Department of Mechanical and Industrial Engineering
November 3, 2020 *Given remotely due to COVID-19*

(2020) How do drivers acquire visual information?
University of Iowa, Department of Psychology
October 23, 2020 *Given remotely due to COVID-19*

(2020) Using Driving to Understand Vision or the Art of Avoiding a Moose to the Face
UC Berkeley, Department of Psychology
July 13, 2020 *Given remotely due to COVID-19*

- (2020) What Can Driving Teach Us About Vision?
University of Indiana – Bloomington, School of Optometry
March 31, 2020 *Given remotely due to COVID-19*
- (2020) What Can Driving Teach Us About Vision?
University of Toronto Mississauga
January 21, 2020
- (2019) Reconsidering the Mechanisms of Situation Awareness in Driving
Toyota Research Institute, Cambridge, MA
May 13, 2019
- (2019) Using Driving to Understand Vision
New England College of Optometry, Boston, MA
April 16, 2019
- (2018) Information Acquisition for Driving
Schepens Eye Research Institute, Boston, MA
August 29, 2018
- (2018) Visual Attention in Driving
Tufts University, Department of Psychology, Medford, MA
January 25, 2018

SELECTED CONFERENCE PRESENTATIONS

- (2020) **Wolfe, B.A.**, Kosovichvea, A., Stent, S., Rosenholtz, R., Attentional Cueing in the World: Temporal and Spatiotemporal Cues for Road Hazards. *Submitted to V-VSS 2021.*
- (2022) **Wolfe, B.A.** Eye Movements and Information Acquisition. International Conference on Traffic and Transport Psychology (ICTTP), August 24-26, 2022 (*postponed from 2020 due to COVID-19*)
- (2020) **Wolfe, B.A.**, Rosenholtz, R., Understanding dynamic scenes: How driving can teach us about scene perception. Vision Sciences Society Annual Meeting. *Presented virtually at V-VSS, June 19-24, 2020, due to COVID-19.*
- (2020) Hernandez, C.I., Rahill, K., Pham, M., Manriquez, L., Louis, P., Figueroa, A., Medina, B., **Wolfe, B.**, Sawyer, B.D., Prevalence effects are not driving hazard detection on the road. Vision Sciences Society Annual Meeting, May 15-20, 2020. *Presented virtually at V-VSS, June 19-24, 2020, due to COVID-19.*
- (2019) **Wolfe, B.A.**, Rosenholtz, R., Why Uber Drivers Scare You: Detecting Road Hazards With Peripheral Vision. Vision Sciences Society Annual Meeting May 17-22, 2019.
- (2018) **Wolfe, B.A.**, Rosenholtz, R., Was that a moose on the road? Gist-like perception of emerging driving hazards. Vision Sciences Society Annual Meeting, May 18-23, 2018.
- (2017) **Wolfe, B.A.**, Fridman, L., Kosovicheva, A.A., Reimer, B. & Rosenholtz, R. Seeing the road in the blink of an eye - rapid perception of the driver's visual environment. Vision Sciences Society Annual Meeting, May 19–24, 2017.
- (2017) Rosenholtz, R., **Wolfe, B.A.**, Sawyer, B., Kosovicheva, A.A. & Reimer, B. Perceptual and attentional factors in detection of driving-relevant visual events. Vision Sciences Society Annual Meeting, May 19–24, 2017.

- (2016) **Wolfe, B.A.**, Dobres, J., Kosovicheva, A.A., Rosenholtz, R., Reimer, B. Reduction in Legibility with Degradation in Older and Younger Observers. Vision Sciences Society Annual Meeting, May 13–18, 2016.
- (2015) **Wolfe, B.A.**, Whitney, D. Object-selective processing of remapped information. Vision Sciences Society Annual Meeting. May 15–20, 2015.
- (2015) Kosovicheva, A. A., **Wolfe, B.A.**, Cavanagh, P., Gorea, A., Whitney, D. Dynamic recalibration of perceived space across the visual hemifields. Vision Sciences Society Annual Meeting. May 15–20, 2015.
- (2015) Wood, K., **Wolfe, B. A.**, Kosovicheva, A. A., Whitney, D. Speeded breakthrough of faces in interocular suppression requires configural information. Vision Sciences Society Annual Meeting. May 15–20, 2015.
- (2014) **Wolfe, B.A.**, Whitney, D. Presaccadic Induction and Spatial Tuning of the Face Aftereffect. Vision Sciences Society Annual Meeting. May 16–21, 2014.
- (2014) Wood, K., **Wolfe, B. A.**, Kosovicheva, A. A., Leib, A. Y., Whitney, D. Foveal input is not required for ensemble coding of emotional faces. Vision Sciences Society Annual Meeting. May 16–21, 2014.
- (2013) **Wolfe, B. A.**, Kosovicheva, A. A., Leib, A. Y., Whitney, D. Beyond fixation: Ensemble coding and eye movements. Vision Sciences Society Annual Meeting. May 10–15, 2013.
- (2012) Kosovicheva, A. A., **Wolfe, B.A.**, Whitney, D. Effects of motion-induced mislocalizations on saccade landing position. Vision Sciences Society Annual Meeting. May 11–16, 2012.
- (2012) **Wolfe, B.A.**, Whitney, D. Presaccadic foveal priming diminishes crowding. Vision Sciences Society Annual Meeting. May 11–16, 2012.
- (2011) **Wolfe, B.A.**, Whitney, D. Egocentric but not allocentric perceptual distortions from saccadic adaptation. Vision Sciences Society Annual Meeting. May 6–11, 2011.
- (2008) **Wolfe, B.A.**, Rowe, C.K., Rushmore, R.J., Valero-Cabre, A. Spatial distribution and temporal dynamics of visuo-spatial attention capabilities in human subjects as revealed by transcranial magnetic stimulation (TMS) on parietal systems and associated networks. Twelfth International Conference on Cognitive and Neural Systems. May 14-17, 2008.

PROFESSIONAL MEMBERSHIPS

2009 – Present	Vision Sciences Society
2014 – Present	Psychonomics Society

REFERENCES

Ruth Rosenholtz, Ph.D.

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Department of Brain and Cognitive Sciences
Massachusetts Institute of Technology
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