

Academic Appointments

Associate Professor

CHESTER F. CARLSON CENTER OF IMAGING SCIENCE
 2020–

Rochester Institute of Technology

Rochester, New York

Assistant Professor

CHESTER F. CARLSON CENTER OF IMAGING SCIENCE
 2013–2020

Rochester Institute of Technology

Rochester, New York

Adjunct Professor

CHESTER F. CARLSON CENTER OF IMAGING SCIENCE
 2020–

The University of Rochester

Rochester, New York

Education

The University of Texas, Austin

POSTDOCTORAL FELLOW

- Postdoctoral Advisors: Mary Hayhoe and Dana Ballard

Austin, Texas

2010–2013

Rensselaer Polytechnic Institute

PH.D. IN COGNITIVE SCIENCE

- Graduate Advisor: Brett R. Fajen

Troy, New York

2010

University of the Mediterranean

VISITING INTERNSHIP

- Academic hosts: Gilles Montagne and Antoine Morice

Marseilles, France

2008

Skidmore College

B.A. PSYCHOLOGY

Saratoga Springs, New York

2004

Journal Articles

RIT student coauthors in bold.

- [1] **Giguere, Arianna P.** and Cavanaugh, Matthew R. and Huxlin, Krystel R. and Tadin, Dujie and Fajen, Brett R. and Diaz, Gabriel J. “The effect of unilateral cortical blindness on lane position and gaze behavior in a virtual reality steering task”. In: *bioRxiv* (2025). DOI: 10.1101/2025.02.06.636925.
- [2] **Fromm, C.**, K. Huxlin, R. Maddox, M. Polonenko, and G. J. Diaz. “Multisensory stimuli facilitate low-level perceptual learning on a difficult global motion task in virtual reality”. In: *Journal Name* (2025). Accepted and pending publication.
- [3] **Giguere, A. P.**, K. R. Huxlin, D. Tadin, B. R. Fajen, and G. J. Diaz. “Optic flow density modulates corner-cutting in a virtual steering task for younger and older adults”. In: *Scientific Reports* 14.1 (2024), p. 27693.
- [4] N. V. Powell, X. Marshall, G. J. Diaz, and B. R. Fajen. “Coordination of gaze and action during high-speed steering and obstacle avoidance”. In: *PLOS ONE* 19.3 (2024), e0289855. DOI: 10.1371/journal.pone.0289855.
- [5] J. Fookien, B. R. Baltaretu, D. A. Barany, G. Diaz, J. A. Semrau, T. Singh, and J. D. Crawford. “Perceptual-Cognitive Integration for Goal-Directed Action in Naturalistic Environments”. In: *Journal of Neuroscience* 43.45 (2023), pp. 7511–7522.
- [6] Aaron R. Seitz, Allison Sekuler, Barbara Doshier, Beverly A. Wright, Chang-Bing Huang, C. Shawn Green, Christopher C. Pack, Dov Sagi, Dennis Levi, Dujie Tadin, Elizabeth Quinlan, Fang Jiang, Gabriel J. Diaz, Geoffrey Ghose, Jozsef Fiser, Karen Banai, Kristina Visscher, Krystel Huxlin, Ladan Shams, Lorella Battelli, Marisa Carrasco, Michael Herzog, Michael Webster, Miguel Eckstein, Nicholas B. Turk-Browne, Nitzan Censor, Peter De Weerd, Rufin Vogels, Shaul Hochstein, Takeo Watanabe, Yuka Sasaki, Uri Polat, Zhong-Lin Lu, and Zoe Kourtzi. “Perceptual Learning: Policy Insights From Basic Research to Real-World Applications”. In: *Policy Insights from the*

Behavioral and Brain Sciences 10.2 (2023), pp. 324–332. doi: 10.1177/23727322231195268. eprint: <https://doi.org/10.1177/23727322231195268>. URL: <https://doi.org/10.1177/23727322231195268>.

- [7] **Yang, Z.**, G. J. Diaz, B. R. Fajen, R. Bailey, and A. G. Ororbia. “A neural active inference model of perceptual-motor learning”. In: *Frontiers in Computational Neuroscience* 17 (2023), p. 1099593. doi: 10.3389/fncom.2023.1099593.
- [8] **Kothari, R., Yang, Z.**, C. Kanan, R. Bailey, and G. J. Diaz. “Gaze-in-wild: A dataset for studying eye and head coordination in everyday activities”. In: *Scientific Reports* 10.1 (2020). doi: 10.1038/s41598-020-59251-5.
- [9] **Binaee, K.** and G. Diaz. “Validation of an augmented reality ground plane for the study of visually guided walking behavior”. In: *Behavior Research Methods* 51.2 (2019). doi: 10.3758/s13428-018-1105-9.
- [10] **Binaee, K.** and G. Diaz. “When attempting to intercept a ball in flight, spatio-temporal constraints can elicit coordinated prediction with hands and eyes”. In: *Journal of Vision* 19.3 (2019). doi: 10.1167/19.12.3.
- [11] G. J. Diaz, M. Parade, and B. Fajen. “The pickup of visual information about size and location during approach to an obstacle”. In: *PLoS ONE* 13.2 (2018).
- [12] A. Morice, G. J. Diaz, B. R. Fajen, N. Babilio, and G. Montagne. “An Affordance-based Approach to Visually Guided Overtaking”. In: *Ecological Psychology* 27.1 (2015), pp. 1–25.
- [13] G. Diaz, J. Cooper, D. Kit, and M. Hayhoe. “Real-time recording and classification of eye movements in an immersive virtual environment”. In: *Journal of Vision* 13.12 (2013), pp. 1–14. doi: 10.1167/13.12.5.
- [14] G. Diaz, J. Cooper, C. Rothkopf, and M. Hayhoe. “Saccades to future ball location reveal memory-based prediction in a virtual-reality interception task”. In: *Journal of Vision* 13.1 (2013), pp. 1–14. doi: 10.1167/13.1.20.
- [15] G. Diaz, J. Cooper, and M. Hayhoe. “Memory and prediction in natural gaze control”. In: *Philosophical Transactions of the Royal Society B: Biological Sciences* 368.1628 (2013).
- [16] G. J. Diaz, B. R. Fajen, and F. Phillips. “Anticipation from Biological Motion: the goalkeeper problem”. In: *Journal of Experimental Psychology: Human Perception and Performance* 48.4 (2012), pp. 848–864.
- [17] B. R. Fajen, G. J. Diaz, and C. Cramer. “Reconsidering the role of movement in perceiving action-scaled affordances”. In: *Human Movement Science* 30.3 (2009), pp. 504–533.
- [18] G. J. Diaz, F. Phillips, and B. R. Fajen. “Intercepting Moving Targets: A little foresight helps a lot”. In: *Experimental Brain Research* 195.3 (2009), pp. 345–360.

Peer Reviewed Conference Proceedings _____ RIT student coauthors in bold.

- [1] **Nguyen, Viet Dung**, Reynold Bailey, Gabriel J. Diaz, **Ma, Chengyi**, Alexander Fix, and Alexander Ororbia. “Deep Domain Adaptation: A Sim2Real Neural Approach for Improving Eye-Tracking Systems”. In: *Proceedings of the ACM on Computer Graphics and Interactive Techniques* 7.2 (2024), pp. 1–17. doi: 10.1145/3654703.
- [2] **Barkevich, Kevin**, Reynold Bailey, and Gabriel J. Diaz. “Using Deep Learning to Increase Eye-Tracking Robustness, Accuracy, and Precision in Virtual Reality”. In: *Proceedings of the ACM on Computer Graphics and Interactive Techniques* 7.2 (2024), pp. 1–16. doi: 10.1145/3654705.
- [3] **Chaudhary, Aayush K., Nair, Nitinraj**, Reynold Bailey, Jeff B. Pelz, Sachin T. Talathi, and Gabriel J. Diaz. “Temporal Gaze Sequences: From real infrared eye-images to synthetic sequences of gaze behavior”. In: *IEEE Transactions on Visualization and Computer Graphics* 28.11 (2022), pp. 3948–3958. doi: 10.1109/TVCG.2022.3181234.
- [4] **Kothari, Rakshit S.**, Reynold J. Bailey, Christopher Kanan, Jeff B. Pelz, and Gabriel J. Diaz. “EllSeg-Gen, towards Domain Generalization for head-mounted eyetracking”. In: *Proceedings of the ACM on Human-Computer Interaction* 6.ETRA (2022), pp. 1–17. doi: 10.1145/3530880.
- [5] **Kothari, Rakshit S., Chaudhary, Aayush**, Reynold Bailey, Jeff B. Pelz, and Gabriel J. Diaz. “EllSeg: An Ellipse Segmentation Framework for Robust Gaze Tracking”. In: *IEEE Transactions on Visualization and Computer Graphics* 27.5 (2021), pp. 2757–2767. doi: 10.1109/TVCG.2021.3067765.
- [6] **Chaudhary, Aayush, Kothari, Rakshit, Nair, Nitinraj**, Jeff B. Pelz, Reynold R. Bailey, and Gabriel J. Diaz. “Rendering of near-eye images for eye-tracking applications”. In: *Proceedings of the ACM Symposium for the Society for Applied Perception*. Sept. 2020.
- [7] **Jogeshwar, Anjali K.**, Gabriel J. Diaz, Susan P. Farnand, and Jeff B. Pelz. “The cone model: Recognizing gaze uncertainty in virtual environments”. In: *Electronic Imaging*. Burlingame, California, United States, Jan. 2020.
- [8] **Nair, Nitinraj, Kothari, Rakshit, Yang, Zhizhuo**, Jeff Pelz, Reynold Bailey, and Gabriel Diaz. “RITEyes – A photorealistic, rendered dataset for the training of robust models for eye image segmentation”. In: *IEEE Xplore and CVF open access* (2019). Submitted to Facebook’s Eye Tracking Segmentation Challenge on August 31, 2019.

- [9] **Chaudhary, Aayush K., Kothari, Rakshit, Acharya, Manoj, Dangi, Shusil, Nair, Nitinraj**, Reynold Bailey, Gabriel J. Diaz, and Jeff B. Pelz. "RITnet: Real-time semantic segmentation of the eye for gaze tracking". In: *2019 IEEE/CVF International Conference on Computer Vision Workshop (ICCVW)*. IEEE, Oct. 2019, pp. 3698–3702.
- [10] **Binaee, Kamran, Starynska, Anna**, Jeff Pelz, Christopher Kanan, and Gabriel J. Diaz. "Characterizing the Temporal Dynamics of Information in Visually Guided Predictive Control Using LSTM Recurrent Neural Networks". In: *Proceedings of the Annual Meeting of the Cognitive Science Society*. 2018.
- [11] **Krueger, Evan, Messier, Erik**, Cristian A. Linte, and Gabriel Diaz. "An interactive, stereoscopic virtual environment for medical imaging visualization, simulation and training". In: *Medical Imaging 2017: Image Perception, Observer Performance, and Technology Assessment*. Vol. 10136. Proc. SPIE. Mar. 2017, 101361H. doi: 10.1117/12.2254645.
- [12] **Pieszala, James**, Gabriel Diaz, Jeff Pelz, Jacqueline Speir, and Reynold Bailey. "3D Gaze Point Localization and Visualization Using LiDAR-based 3D Reconstructions". In: *Eye Tracking Research and Applications*. Charleston, South Carolina, United States, Mar. 2016.
- [13] **Kothari, Rakshit, Binaee, Kamran**, Jonathan Matthis, Reynold Bailey, and Gabriel J. Diaz. "Novel apparatus for investigation of eye movements when walking in the presence of 3D projected obstacles". In: *Eye Tracking Research and Applications*. Charleston, South Carolina, United States, Mar. 2016.
- [14] **Binaee, Kamran**, Gabriel Diaz, Jeff Pelz, and Flip Phillips. "Binocular Eye tracking Calibration During a Virtual Ball Catching task using Head Mounted Display". In: *Symposium on Applied Perception*. Anaheim, California, United States, July 2016.

Invited Talks

- [1] *Pervasive Eye Tracking Research*. Seattle, Washington, June 2024.
- [2] *Improved Mobile Eye Tracking with Video and Event Based Sensors*. York University, June 2022.
- [3] *The Present and Future of Mobile Eye Tracking*. Johns Hopkins University, Nov. 2022.
- [4] *The Development of Networks Trained on Synthetic Eye Movement Sequences for Improved Mobile and XR-integrated Eye Tracking*. Leeds University, Sept. 2020.
- [5] *Prediction in Visually Guided Action*. Alicante, Spain, Apr. 2019.
- [6] *Symposium: From lab-based studies to eye-tracking in virtual and real worlds: conceptual and methodological problems and solutions*. Invited by Facebook to present at "Eye Tracking for VR and AR" Offer declined due to a conflict with a prior commitment to travel to Giessen, Germany. Seoul, Korea, Nov. 2019.
- [7] *Prediction in Visually Guided Action*. Giessen University, Oct. 2019.
- [8] *Prediction in Visually Guided Action*. Massachusetts Institute of Technology, Sept. 2019.
- [9] *Online and Predictive Modes of Control in Ball Interception*. Vrije Universiteit, Amsterdam, Netherlands, 2019.
- [10] *The Future of Virtual Reality in Film and Animation*
The Role of Science in Virtual Reality. The Beijing Film Academy, 2015.
- [11] *Virtual Reality Investigations of Eye Movements and Prediction in Visually Guided Action*. The Ohio University, 2014.
- [12] *Internal Models for Predictive Saccades in a Natural Interception Task*. Rochester Institute of Technology, 2013.
- [13] *Internal Models for Predictive Saccades in a Natural Interception Task*. The University of Rochester, Sept. 2013.
- [14] *Internal Models for Predictive Saccades in a Natural Interception Task*. Rensselaer Polytechnic Institute, Mar. 2013.

Workshop and Conference Organization

- [1] *Steering Using Optic Flow in the Presence of Cortical Blindness*. SfN is the world's largest conference on neuroscience, with >30k in-person attendees annually. Ours was one of 18 of more than 150 minisymposia chosen to be both live webcast and recorded. Washington DC, Nov. 2023.
- [2] *Workshop on Eye Tracking in Virtual Reality*. Giessen, Germany, Oct. 2019.
- [3] *OSA: Color and Vision*. Washington DC, 2018.
- [4] *University of Rochester Symposium on AR/VR*. 100 attendees. Rochester, NY, 2018.
- [5] *Workshop on Eye Tracking in Virtual Reality*. 15 attendees. Vrije Universiteit, Amsterdam, 2018.
- [6] *Workshop on Eye Tracking in Virtual Reality*. 30 attendees. St. Petersburg, Florida, 2018.
- [7] *Workshop on Eye Tracking in Virtual Reality*. 40 attendees. Wupertal, Germany, 2017.

Service to the Profession

- [1] Guest Editor. Special Issue: The Use of Body and Gaze in Extended Reality. 2025.
- [2] Abstract/Submission Review Committee. Vision Science Society. 2017-Present.
- [3] Abstract/Submission Review Committee. Society for Applied Perception. 2017-2020.
- [4] Abstract/Submission Review Committee. Human Centered Computational Sensing. 2020.
- [5] Abstract/Submission Review Committee. World Haptics Conference. 2017.
- [6] Guest Editor for pending Issue on AR/VR (Editor, Marty Banks). Journal of Vision.
- [7] Reviewer. Nature: Scientific Reports.
- [8] Reviewer. Journal of Experimental Psychology: Human Perception and Performance.
- [9] Reviewer. Experimental Brain Research.
- [10] Reviewer. Perception.
- [11] Reviewer. Acta Psychologica.
- [12] Reviewer. Attention, Perception, Psychophysics.
- [13] Reviewer. PLOS One.
- [14] Reviewer. Vision Research.
- [15] Reviewer. Transactions on Computer Graphics.
- [16] Reviewer. PNAS.
- [17] Reviewer. Siggraph Asia.

External Funding

- [1] Diaz (Co-I). *Engineering Research Center*. National Science Foundation. Budget: > \$20 million, Pre-submission declined. 2025.
- [2] Ororbia (Co-PI) Diaz (PI) Bailey (Co-I). *HCC: Medium: New Methods for Eye Tracking from Spatially Sparse, Temporally Dense Data*. National Science Foundation. Under review. Oct. 2024.
- [3] Diaz (PI). *Navigation in the Presence of Stroke Induced Cortical Blindness: Behavior, Models, and a Path Towards Rehabilitation*. The Research to Prevent Blindness foundation. Amount: \$300,000. 2023-2026.
- [4] Ororbia (Co-I) Diaz (PI) Bailey (Co-I). *HCC: Medium: New Methods for Energy Efficient Eye Tracking from Spatially Sparse, Temporally Dense Data*. National Science Foundation. Declined. Reviews (Excellent/Very Good, Good, Good/Fair, Good/Fair). Nov. 2023.
- [5] Diaz (Co-I). *AWAREness for Sensing Humans Responsibly with AI*. National Science Foundation. Amount: \$1,994,626. 2021-2026.
- [6] Diaz Co-I. *Engineering Research Center*. National Science Foundation. Budget: > \$20 million, Pre-submission declined. 2024.
- [7] Bailey (Co-I) Diaz (PI). *Improved Semantic Segmentation with Natural Gaze Dynamics – Year 2*. Facebook Reality Labs. Amount: \$299,561. 2022-2024.
- [8] Diaz (PI). *Development and Assessment of Virtual Reality Paradigms for Gaze Contingent Visual Rehabilitation*. The National Institute of Health. Amount: \$393,200. Awarded March, 2020. One year no-cost extension approved 2023. 2021-2024.
- [9] Pelz (Co-PI) Diaz (PI) Bailey (CoPI). *Amendment to Improved Semantic Segmentation with Natural Gaze Dynamics*. Facebook Reality Labs. Amount: \$68,063. 2021.
- [10] Pelz (Co-PI) Diaz (PI) Bailey (Co-PI). *Improved Semantic Segmentation with Natural Gaze Dynamics*. Facebook Reality Labs. Amount: \$278,214. 2020-2021.
- [11] Diaz (Co-I) Dube (PI). *REU: Imaging in the Physical Sciences*. The National Science Foundation. Amount: \$267,467. 2017-2020.
- [12] Huxlin (Co-PI) Diaz (Co-PI). *Developing a virtual reality approach to study and rehabilitate vision after stroke*. The UNYTE Foundation. Amount: \$10,000. 2018-2019.
- [13] Pelz (Co-PI) Diaz (Co-PI). *Machine Learning for Gaze Event Detection During Natural Behavior*. Daydream Labs of Google Inc. Amount: \$100,000. 2018.
- [14] Pelz (Co-PI) Diaz (Co-PI). *Behavioral Analysis of Cashiers and Customers During Cash Transactions*. The National Academy of Sciences. Amount: \$65,000. 2017-2018.
- [15] Diaz (PI). *Gift from donor Peter Blacksborg*. Peter is an RIT alum and enthusiastic donor. He has visited my lab several times, and continues to make small donations in support of ongoing research. Amount: \$4,500. 2020.

Graduate Advising

- [1] Chengyi Ma. *Ph.D. Imaging Science*. 2025-present.
- [2] Triya Belani. *Ph.D. Imaging Science*. 2025-present.

- [3] Kevin Barkevich. *Ph.D. Computer Science*. Co-advised with Reynold Bailey. 2021 - present.
- [4] Arianna Giguere. *Ph.D. Imaging Science*. 2021 - 2025.
- [5] Chengyi Ma. *M.S. Computer Science*. 2023-2025.
- [6] Abhijan Wasti. *M.S. Computer Science*. 2023-2025.
- [7] Catherine Fromm. *Ph.D. Imaging Science*. 2016 - 2022.
- [8] Rakshit Kothari. *Ph.D. Imaging Science*. 2016-2021.
- [9] Kamran Binaee. *Ph.D. Imaging Science*. 2014-2019.

Classes Taught

Human Vision

GRADUATE LEVEL

A core course in the Imaging Science graduate student curriculum.

Interactive Virtual Environments

GRADUATE LEVEL

A project based course designed to teach students the human vision of virtual environments, and how to design interactive tasks for psychophysical research.

Advanced Methods of Eye Tracking

GRADUATE LEVEL

A project based course designed to teach students about mobile eye tracking and eye tracking in virtual reality. Students engage in data collection, filtering, analysis, and visualization, and learn about associated hardware as an imaging system, with specific emphasis paid to the underlying algorithms for feature based and model based eye gaze estimation.

Probability and Statistics for Imaging Science

UNDERGRADUATE LEVEL

Vision & Psychophysics

UNDERGRADUATE LEVEL

Thesis Committees

- [1] Zhizhuo "George" Yang. *Ph.D. in Computer Science*. Primary Advisor: Alex Ororbia, RIT. 2024.
- [2] Anjali Jogeshwar. *Ph.D. in Imaging Science*. Primary Advisor: Susan Farnand, RIT. 2023.
- [3] Ming Ming Yang. *Ph.D. in Color Science*. Primary Advisor: Jeff Pelz, RIT. 2023.
- [4] Maryam Keyvanara. *Ph.D. in Computer Science*. Primary Advisor: Robert Allison, York University. 2022.
- [5] Aayush Chaudhari. *Ph.D. in Imaging Science*. Primary Advisor: Jeff Pelz. 2021.
- [6] Dorothy-Dickson-Vandervelde. *Ph.D. in Astrophysics*. Primary Advisor: Joel Kastner. 2022.
- [7] Lili Zhang. *Ph.D. in Color Science*. Primary Advisor: Michael Murdoch. 2020.
- [8] Yongmin Park. *Ph.D. in Color Science*. Primary Advisor: Michael Murdoch. 2020.
- [9] Anjali Jogeshwar. *M.S. in Imaging Science*. Primary Advisor: Jeff Pelz. 2018.
- [10] George Yang. *Ph.D. in Computer Science*. Primary Advisor: Reynold Bailey. 2018.
- [11] Dengyu Liu. *M.S. in Imaging Science*. Primary Advisor: Jim Ferwerda. 2015.
- [12] Dong Wang. *Ph.D. in Imaging Science*. Primary Advisor: Jeff Pelz. 2015.
- [13] Rahul Gopinathan. *M.S. in Computer Science Capstone Project*. 2014.

Pregraduate Advising

I have provided significant hands-on involvement in active research and/or senior project experiences for approximately 20 undergraduates, and providing mentoring for 12 high school students through a 2 month summer internship program at the Center for Imaging Science.