

Dylan M. Diaz

dylاندiaz101@yahoo.com | [linkedin.com/in/dylan-diaz-9128a1213](https://www.linkedin.com/in/dylan-diaz-9128a1213) | github.com/DylanDiaz101

Interests: Cognitive Control, Working Memory, Visual Perception, Computational Models

Education

Bachelor of Science in Computer Science, Minor in Psychology & Data Science

California State University, San Bernardino | September 2019 - Present

Major GPA: **3.94** | Cumulative GPA: **3.79**

Relevant Coursework: Research Methods in Psychology, Research Ethics and Reproducibility, Cognitive Psychology, Cognitive Neuroscience (IP), Statistics, Applied Linear Algebra, Machine Learning, Artificial Intelligence, Computer Science II

Publications

Peer-Reviewed Journal

Reimer, J., **Diaz, D. M.**, Bhatt, V., Martinez, J., Jin, J., & Rosales, K. (**In Review**) *Temporal Convolutional Network Modeling of Eye Gaze: Identifying Latent Implementation States Underlying Proactive Cognitive Control*. Submitted to the Psychonomic Bulletin & Review.

Diaz, D. M., Bhatt, V., Reimer, J., Martinez, J., Jin, J., & Rosales, K. (**In Preparation**) *Self-Supervised TCNs and RNNs for AOI-Free Modeling of Sequential Eye Gaze Data in a Cognitive Control Task*.

Rosales, K., Reimer, J., **Diaz, D. M.**, & Martinez, J. (**In Preparation**). *The Psychometric Structure of Working Memory and Fluid Reasoning: An Analysis Utilizing Network Modeling*.

Peer-Reviewed Conference Proceedings

Diaz, D. M., & Henderson, M. M., (2026) (**In Review**). *Eccentricity-Constrained CNN Training Reveals Adaptive Information Coding Around the Visual Field*. Proceedings of the 9th Annual Conference on Cognitive Computational Neuroscience., New York, NY.

Bhatt, V., Rajani, N., **Diaz, D. M.**, Thakar, D., Dajani, K., & Jin, J., (May, 2026) (**Accepted**). *Modeling Mind and Mood with CLAIRE: A Cognitive-Linguistic Architecture for Interpretable Reasoning and Emotion*. Proceedings of the IEEE Conference on Artificial Intelligence., Granada, Spain.

Presentations

Conference Posters

Diaz, D. M., Bhatt, V., Martinez, J., Jin, J., Rosales, K., & Reimer, J. (April, 2026) *AOI-Free Discovery of Proactive-Control Gaze Patterns in the AX-CPT with Self-Supervised Temporal Convolutional Networks*. Accepted abstract for the Western Psychological Association Annual Convention, Tacoma, WA.

Martinez J., **Diaz, D. M.**, Zavala, S., Kuhlman, S., Hernandez, G., Sanchez, E., Smith, J., Arrizon, V., Crawford, I., Zait, T., Casarrubias, N., Rosales, K., & Reimer, J. (April, 2026) *Exploring the Causal Link Between Proactive Cognitive Control and Eye Movements During a Spatially Modified AX-CPT*. Accepted abstract for the Western Psychological Association Annual Convention, Tacoma, WA.

Rosales, K., Reimer J., **Diaz, D. M.**, Canchola, S., Martinez, J., Melendez, L., Delgado, L., Garibaldi, B., Ponce, E., Nalvarte, T., Wheeler, D., & Mier, J. (November, 2025) *Testing the Relationship Between Working Memory and Fluid Reasoning via Network Analysis*. Poster presentation at the 66th Annual Meeting for the Psychonomic Society, Denver, CO.

Diaz, D. M., & Henderson, M. (August, 2025) *Foveal vs Peripheral: Exploring Visual Eccentricity Bias in Dual-Stream DCNNs using Egocentric Data*. Poster presentation at the Center for the Neural Basis of Cognition Computational Neuroscience Day, Pittsburgh, PA.

Rosales, K., Reimer J., **Diaz, D. M.**, Canchola, S., Martinez, J., Melendez, L., Delgado, L., Garibaldi, B., Ponce, E., Nalvarte, T., Wheeler, D., & Mier, J. (November, 2024) *The Psychometric Structure of Working Memory: An Analysis utilizing Network Modeling*. Poster presentation at the 65th Annual Meeting for the Psychonomic Society, New York, NY.

Reimer, J., Rosales, K., Canchola, S., **Diaz, D. M.**, Delgado, L., Garibaldi B., & Martinez, J. (November, 2023) *Ocular Measures of Controlled Processing: The Role of Working Memory Updating in Proactive Cognitive Control*. Poster presentation at the 64th Annual Meeting for the Psychonomic Society, San Francisco, CA.

Talks & Invited Presentations

Bhatt, V., Rajani, N., **Diaz, D. M.**, Thakar, D., Dajani, K., & Jin, J. (February, 2026). *Stabilizing Affective Representations with CLAIRE: A Cognitive-Linguistic Architecture for Interpretable Reasoning and Emotion*. Oral presentation at the IEEE International Conference on Semantic Computing., Laguna Hills, CA.

Diaz, D. M. & Martinez, J. (February, 2026). *Testing the Relationship Between Working Memory and Fluid Reasoning via Network Analysis*. Oral presentation at the 40th CSUSB Student Research Competition, San Bernardino, CA.

Diaz, D. M. (November, 2025). *What is computational neuroscience? A computational model of eccentricity bias*. Invited talk presented at the Neuroscience Club Research Blitz, California State University, San Bernardino, CA.

Diaz, D. M. & Henderson, M. (October, 2025). *Comparing Foveal, Peripheral, and Fused Streams in a DCNN of Visual Eccentricity Bias*. Oral presentation at the Cal-Bridge 2025 Fall Conference, Irvine, CA.

Academic Fellowships and Awards

NSF Experiential Computing and Engaged Learning Scholarships Program (ExCELS) **December 2025**

Best Poster Presentation at the CSUSB Palm Desert Campus ShowCASE **November 2025**

Cal-Bridge Undergraduate Scholars Program **July 2025**

- A two-year program facilitating graduate school workshops and one-on-one joint mentorship from a CSU and UC professor

Office of Student Research: Travel and Research Grant **October 2024**

T34 NIH U-RISE Program **Summer 2024**

- A two-year initiative providing hands-on research training, coursework, and funding to undergraduate students

University Honors Program **Fall 2022**

- Supports students committed to original research, cross-disciplinary collaboration, community engagement, and leadership through a rigorous curriculum of workshops and symposiums
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Research Experience

Summer REU Scholar (Incoming)

Big Ten Academic Alliance - Purdue University, West Lafayette, IN

June - July 2026

Supervisor: Dr. Yu Chin-Chiu

- Under the direction of Dr. Chiu, I will analyze EEG data from a study on reward, motivation, and cognitive control, and help develop a new experimental task that combines eye tracking and EEG to measure attention and brain activity simultaneously.

Lab Manager/Research Assistant

Learning Research Institute - California State University, San Bernardino

Aug 2022 - Present

Supervisor: Dr. Jason F. Reimer

Honors Thesis Project (In Progress)

Event Structure and Cognitive Control Within Virtual Reality

Supervisor: Dr. Jason F. Reimer

- Developing a virtual reality version of a cognitive control task in the Unity game engine to examine how changes in environmental structure influence attention and goal-directed behavior under more realistic, everyday conditions.

Analysis of Sequential Gaze Data to Reveal Patterns of Latent Cognitive States using Machine Learning

(In Progress)

Supervisor: Dr. Jason F. Reimer & Dr. Jennifer Jin

- Built a computational pipeline that uses machine learning (TCN/RNN) to identify hidden patterns in eye-movement behavior during a cognitive task, with the goal of revealing theoretically informed changes in internal cognitive states over time.
- Evaluated the reliability of the approach through repeated model testing, comparison across alternative methods, and robustness analyses.

The Psychometric Structure of Working Memory & Fluid Reasoning: Approach Utilizing Network Analysis

Jan 2024 - Jan 2025

Supervisors: Dr. Kevin P. Rosales (MiND Lab) & Dr. Jason F. Reimer

- Designed a study examining how different components of working memory relate to fluid reasoning using statistical and network-based modeling approaches.
- Managed 15 cognitive tasks across a three-session correlational study with more than 130 participants, measuring attention, short-term memory, long-term retrieval, reasoning, and decision-making.
- Onboarded 14+ new research assistants, created standardized protocols and lab manuals, and coordinated lab workflow

Ocular Measures of Controlled Processing Cue Maintenance and Working Memory in Proactive Control

Aug 2022 - Dec 2023

Supervisor: Dr. Jason F. Reimer

- Supported data collection for an eye-tracking study of attention and cognitive control with 106 participants, collecting approximately 159 hours of gaze and behavioral data.
- Developed Python-based preprocessing and analysis scripts to improve the efficiency and consistency of large-scale eye-tracking data analysis.

Summer REU Scholar - Center for the Neural Basis of Cognition, Carnegie Mellon University, Pittsburgh, PA

May - Aug 2025

Supervisor: Dr. Maggie M. Henderson

Foveal vs. Peripheral: Exploring Visual Eccentricity Bias in Dual-Stream DCNNs using Egocentric Data

- Developed a deep learning model to study how visual systems prioritize central versus peripheral information, using first-person video data from 266 recording sessions.
- Trained and evaluated the model across multiple experimental conditions to compare learning strategies and data formats, using classification accuracy, recall, precision, and confusion matrices to assess performance.

Technical Skills

Research Software

SPSS, E-Prime, Inquisit, PsychoPy, Qualtrics, MATLAB, Zotero, SONA Research Management

Programming/Computational

SLURM HPC, Python, R, C++, C, C#, HTML & CSS, SQL, Unity Game Engine, SteamVR

Certifications

Social Behavioral Research Investigators and Key Personnel CITI Training

Clubs and Memberships

Neuroscience Club at CSUSB

2025 - Present

Psi Chi

2025 - Present

Psychonomics Society

2023 - Present

Western Psychological Association

2023 - Present

References

Jason F. Reimer, PhD

Professor of Psychology, Department of Psychology, CSU, San Bernardino

jreimer@csusb.edu

Kevin P. Rosales, PhD

Assistant Professor of Child Development, Department of Child Development, CSU, San Bernardino

kevin.rosales@csusb.edu

Jennifer Jin, PhD

Associate Professor of Computer Science, Department of Computer Science & Engineering, CSU, San Bernardino

jennifer.jin@csusb.edu

Maggie M. Henderson, PhD

Assistant Professor of Psychology and Neuroscience Institute, Department of Psychology, Carnegie Mellon University

mmhender@andrew.cmu.edu
