

Rohin Palsule

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EDUCATION

Bachelor of Science in Cognitive Science

September 2021 - June 2025

University of California, Irvine

GPA: 3.98, Major GPA: 3.99

Summa Cum Laude; Phi Beta Kappa Honors Society

Senior Thesis (Cognitive Sciences): Framing effects on the navigation of complex associative networks across the lifespan

RESEARCH INTERESTS

Computational Cognitive Science, Naturalistic Cognitive Science, Narrative Structure, Neural Imaging

RESEARCH EXPERIENCE

Cognitive Science Full-Time Lab Manager (UC Irvine)

July 2025 - Present

Computational Cognitive Neuroscience Lab, PI: Dr. Aaron Bornstein

- Developed an analysis pipeline for fMRI data using PyMVPA and SPM, creating a neural classifier to decode objects and scenes in older and younger adults and developing an RSA pipeline to identify changes in structure learning before and after learning a graph structure.
- Evaluated gray matter volume in hippocampus, mPFC, and VTC in young adults when learning a complex graph structure and engaging in model-based multi-step decision making.
- Created two fMRI experiments for the lab's NIH aging grant using PsychoPy evaluating the neural mechanisms of structure learning and decision making in older and younger adults.
- Co-authored a grant to the UCI Facility for Imaging and Brain Research (FIBRE) proposing an fMRI experiment about the neural mechanisms of patch foraging in older adults, specifically how state-space uncertainty impacts sequential decision making.
- Reevaluated a metric of narrative flow into one capturing contextual information gain, and identified similarities in human judgements of importance and causal structure.
- Programmed and administered an online computer-based experiment from the ground up using jsPsych to investigate older adults' ability to learn an implicit graph structure through only learning the image pairs.
- Recruited and led undergraduate research assistants in administrative work and research activities.
- Started a journal club, guiding discussions on relevant research papers including narrative structure and its effects on memory and computational reinforcement learning models.

Cognitive Science Research Fellow (UC Irvine)

November 2023 - June 2025

Computational Cognitive Neuroscience Lab, PI: Dr. Aaron Bornstein

- Coded and supervised a computer-based online experiment to test differences in younger and older adults on their ability to form memory associations based on the task schedule.
- Created an online survey capturing audio responses encoded and stored in a server hosted by Supabase, and made a script to decode these responses into organized mp4 files.
- Replicated an online task regarding human adaptive planning when harvesting in different environments into a local PsychoPy script in collaboration with Dr. Joyner's CREAM lab at UC Berkeley.
- Hosted a collaborative workshop for undergraduates in the lab to learn best practices for efficient, clean code while guiding them through developing online and local tasks.

Cognitive Science and Education Research Fellow (UC Irvine)

January 2023 - Present

Language and Learning Analytics Lab, PI: Dr. Nia Dowell

- Assisted in analyzing and writing sections of a graduate student's dissertation project, focusing on how the knowledge construction process impacts collaborative decision making in a text-based digital environment.
- Quantified around 1200 total lines of over 24 undergraduate student communication and group discussion datasets to understand small group collaborative problem solving.
- Applied an Interactive Analysis Model (IAM) to score text-based conversations and Lag Sequential Analysis (LSA) to examine interactions between different knowledge construction phases.
- Conducted and presented an award winning independent research project at the UCI UROP Symposium.

Cognitive Science Research Assistant (UC Irvine)

May 2023 - September 2023

Working Memory and Plasticity Lab, PI: Dr. Susanne Jaeggi

- Administered 18 in-person sessions with older adults using EEG caps and BrainVision software while running cognitive tasks on PsychoPy in an attempt to see if different visual-auditory stimulation can improve memory performance in the later lifespan.
- Supervised 19 virtual sessions where older participants completed cognitive game training tasks and provided technical and administrative support while recording the outcomes of the sessions.

HONORS AND AWARDS

2024 Chancellor's Award winner for Poster Presentations (2024) - Best research project and poster presentation in the category "Human Experience and Expression." Received at the 2024 UROP Symposium.

CONTRIBUTED TALKS

Palsule, R.A., Goeschel, A. (2026, April 21) Presentation at Johns Hopkins University on evaluating a metric of contextual information gain with human judgements on narratives.

PUBLICATIONS

Palsule, R.A., Goeschel, A., Khoudary, A., Chen, J., Bornstein, A.M. (2026) Evaluating the neural mechanisms of narrative based contextual credit assignment., paper: in prep

Goeschel, A., **Palsule, R.A.,** Chen, J., Bornstein, A.M., Khoudary, A. (2026) Quantifying information gain in narrative stimuli using open-source large language models, *Proceedings of the 9th Annual Conference on Cognitive Computational Neuroscience*:under-review.

Chen, R., Johnson, M.P., **Palsule, R.A.,** Maxwell, M., Harhen, N.C., Noh, S.M., Bennett, I., Bornstein, A.M. (2026) Structure learning model reveals age-related differences in patch-leaving task, *Proceedings of the 9th Annual Conference on Cognitive Computational Neuroscience*:under-review.

POSTER PRESENTATIONS

Goeschel, A.*, **Palsule, R.A.*,** Khoudary, A., Chen, J., Bornstein, A.M. (2026, August 3-9) Quantifying information gain in narrative stimuli using open-source large language models, Computational Cognitive Neuroscience 2026, New York. [Poster]

Palsule, R.A., Goeschel, A., Khoudary, A., Yoo., J., Chen, J., Bornstein, A.M. (2026, April 9) Comparing a large language model-derived metric of contextual information gain with human judgements in narratives, 2026 Center for

- the Neurobiology of Learning and Memory Spring Conference, Irvine. [Poster]
- Johnson, M.P., Chen, R., **Palsule, R.A.**, Maxwell, M., Harhen, N.C., Noh, S.M., Bennett, I., Bornstein, A.M. (2026) Older Adult Differences in Exploration Measured Using a Structured Foraging Task, *Gerontological Society of America 2026*, under review [Poster]
- Palsule, R.**, Guo, J., Noh, S., Bornstein, A. (2025, November 19). *Naturalistic task framing improves older adults' ability to infer and navigate complex associative networks*, Society for Neuroscience 2025, San Diego. [Poster]
- Palsule, R.**, Guo, J., Noh, S., Bornstein, A. (2025, June 2). *Framing effects on the navigation of complex associative networks across the lifespan*, 2025 UCI Cognitive Science Honors Symposium, University of California, Irvine. [Poster]
- Palsule, R.***, Guo, J.*, Noh, S., Bornstein, A. (2025, May 16). *The Contribution of Naturalistic Structure when Learning Complex Associations*, 2025 UCI UROP Symposium, Mind, Memory, and Learning category, University of California, Irvine. [Poster]
- Guo, J.*, **Palsule, R.***, Noh, S., Bornstein, A. (2025, May 16). *The Relation of Task Schedule and Age-Related Differences in Learning Memory Associations*, 2025 UCI UROP Symposium, Mind, Memory, and Learning category, University of California, Irvine. [Poster]
- Palsule, R.**, Dowell, N. (2024, May 17). *The Impact of Socioemotional Communication on Text-Based Group Decision-Making*, 2024 UCI UROP Symposium, Human Experience and Expression category, University of California, Irvine. [Poster]

RELEVANT COURSEWORK

Cognitive Sciences 210B - Cognitive Modeling (Grade: A)

Taught by Dr. Aaron Bornstein (UCI)

- Explored various cognitive reinforcement learning models, including the Drift Diffusion Model (DDM/RLDDM) and the Markov Decision Process (MDP/POMDP) as a framework for planning and decision-making.
- Engaged with emerging research on model-based and model-free learning, rationality/optimality, and approach/avoidance phenomenon in cognitive science.

Computer Sciences 257 - Brain Inspired Learning Systems (Grade: A)

Taught by Dr. Mohsen Imani (UCI)

- Examined the application of Hyperdimensional Computing (HDC) and Vector Symbolic Architecture (VSA) to simulate and model human memory.
- Implemented HDC using PyTorch, and evaluating the robustness and various uses of the structure when it comes to memory.
- Connected HDC structures to current research in an effort to model cognitive behavior in graph learning.

LEADERSHIP EXPERIENCE

Anteaters' Habitat for Humanity - Co-President

Sept 2024- June 2025

- Led and supervised a board of undergraduate students, fostering a collaborative, welcoming and goal-oriented environment to encourage new membership and successfully execute any proposed events.
- Facilitated board and general meetings focusing on group planning and problem-solving for fundraisers, volunteer projects, and social events.
- Developed leadership and communication skills through overseeing individual events, ensuring group cohesion, and maintaining accountability.

United Parcel Service - Sales Associate

June 2023- June 2025

- Managed daily store operations, ensuring efficient and quality customer service.
- Assisted customers with packaging, returns, passport photos, and other logistical services.
- Developed problem-solving and communication skills by addressing customer questions, resolving any problems, and ensuring the store was successful.

TECHNICAL SKILLS

Computer: Python (PsychoPy, Pytorch, Scikit-learn, TensorFlow, PyMVPA, Brainiak), JavaScript (jsPsych), HTML, MatLab (PsychToolBox, SPM), Bash/Linux, AWS/Amazon S3, Supabase, Vercel

Models: Neural Classifier, MVPA, Hyperdimensional Computing, Sequentiality, Partially Observable Markov Decision Processes, Reinforcement Learning Drift Diffusion Models

Languages: Spanish (conversational)

REFERENCES

Dr. Aaron Bornstein

Associate Professor in Cognitive Sciences

Principal Investigator in the UCI Computational Cognitive Neuroscience Lab

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Dr. Nia Nixon-Dowell

Assistant Professor

Principal Investigator in the UCI Language and Learning Analytics Lab

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Dr. Barbara Doshier

Distinguished Professor in Cognitive Sciences

Head of the UCI Cognitive Science Honors Department

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