

Holly Kular

University of California San Diego | hkular@ucsd.edu | hkular.github.io

Computational neuroscientist with a strong background in developing models that bridge human and machine perception. My research statistically compares human vs. model behaviors to improve human-centered technologies and computational algorithms related to: visual design, user perception, decision-making, and user intentions.

EXPERIENCE

Graduate Researcher – UCSD

Neural network models of probabilistic tasks

Project Links: RNN Decisions, RNN Memories

- Developed and tested recurrent neural networks to model perceptual decision-making tasks.
- Applied machine learning techniques, including SVM, PCA, and linear regression, for model evaluation and feature analysis.
- Generated and validated behavioral and neural predictions for visual decision tasks, contributing to enhanced model reliability in complex environments.

Perception and visual decision making

Project Links: Eye tracking, Working Memory

- Explored the interaction between eye movements and visual decision tasks using eye-tracking data.
- Designed and implemented experiments investigating visual interference in working memory.
- Applied Bayesian methods to test models and fit linear regression, enhancing the accuracy of decision-making models.

Research Coordinator – Stanford University

Visual perception and neuroscience

- Collected and analyzed brain imaging data utilizing image processing tools and best practices for large datasets.
- Collected and analyzed EEG data to examine visual processing stream.

SKILLS

- **Technical:** Python (NumPy, Matplotlib, PyTorch, scikit-learn, pandas), machine learning, data analysis, signal processing, experiment design, model fitting.
- **Languages:** Python, MATLAB, R, CSS/HTML, JavaScript.

EDUCATION

University of California San Diego

Advisor: John Serences

PhD Experimental Psychology

MA Experimental Psychology

University of California Los Angeles

BS Neuroscience

Area: Cognitive Neuroscience

Sept 2021 | Expected: Jun 2026

Sept 2021 | Jun 2023

Sept 2015 | Jun 2019

CONFERENCES

Kular and Serences, "Working memory errors from distraction are not influenced by sensory noise at encoding," in *Journal of Vision*, 2024.

Dalski, **Kular**, Jorgensen, Grill-Spector, and Grotheer, "Both mots-words and pots-words prefer emoji stimuli over text stimuli during a reading task," in *Journal of Vision*, 2023.

Kular, Adam, and Serences, "Working memory is robust to distractors but not sensory uncertainty," in *Journal of Vision*, 2023.

PUBLICATIONS

Dalski, . **Kular**, and Grill-Spector, "Both mots-words and pots-words prefer emoji stimuli over text stimuli during a lexical judgment task," *Cerebral Cortex*, 2024.

Nordt, ..., **Kular**, and Grill-Spector, "Longitudinal development of category representations in ventral temporal cortex predicts word and face recognition," *Nature Communications*, 2023.

Grotheer, ..., **Kular**, ..., and Grill-Spector, "White matter myelination during early infancy is linked to spatial gradients and myelin content at birth," *Nature Communications*, 2022.

Natu, ..., **Kular**, ..., and Grill-Spector, "Infants' cortex undergoes microstructural growth coupled with myelination during development," *Communications Biology*, 2021.

Nordt, ..., **Kular**, ..., and Grill-Spector, "Cortical recycling in high-level visual cortex during childhood development," *Nature Human Behavior*, 2021.

Awards

The Vision Sciences Society National Eye Institute Travel Grant	2023
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Mentoring

Anika Bhandari (UCSD, undergraduate researcher, Spring 2024 - Present)
Sage Goldberg (UCSD, undergraduate researcher, Fall 2023 - Spring 2024)
David Wu (UCSD, undergraduate researcher, Summer 2023 - Spring 2024)
Jialin (Joyce) He (UCSD, master's student, Fall 2022 - Spring 2023)
Hannah Lincoln (UCSD, undergraduate researcher, Fall 2022 - Fall 2023)
Jessie Qiu (UCSD, undergraduate researcher, Winter 2023 - Fall 2023)
Mariela Mendoza (UCSD, undergraduate researcher, Spring 2022 - Spring 2023)
Julia Jorgensen (Stanford, undergraduate researcher, Spring 2021)

Service

Graduate Talk Series Representative	2024
Climate/Diversity Committee, Graduate Member	2023 - Present
Colloquium Representative	2023
UCSD Neuro Outreach Program	2023 - Present
UCSD Diversifying Psychology Event, Presenter	2022 - Present
Graduate Application Mentorship Program	2023
Computational Social Science Master's Program Mentor	2023

Teaching

Lecture: Neuroscience and Neuroimaging (UCSD, Psychology PhD orientation)	2023
Lecture: Neuroimaging (UCSD, PSYC108)	2023
Teaching Assistant: Behavioral Neuroscience (UCSD, PSYC106)	2024
Teaching Assistant: Developmental Psychology (UCSD, PSYC101)	2024
Teaching Assistant: Cognitive Neuroscience (UCSD, PSYC108)	2023
Teaching Assistant: Visual Cognition (UCSD, PSYC106)	2023
Teaching Assistant: Psychology and Law (UCSD, PSYC162)	2022
Teaching Assistant: Social Psychology (UCSD, PSYC104)	2021