

AISHNI PARAB

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[Google Scholar](#)

[Linkedin](#)

[Github](#)

[Website](#)

EDUCATION

University of California, Los Angeles

PhD Statistics (Advanced to Candidacy, C. Phil)

M.Sc. Computer Science

Jun 2027 (expected)

Sep 2022 - Present

Sep 2020 - Jun 2022

University of California, Santa Cruz

B.Sc. Computer Science

Sep 2014 - Mar 2018

GRANTS, SCHOLARSHIPS & AWARDS

- ONR Grant, Human-inspired Computational Models of Vision-Language Interactions for Agents (2023 - 2024) [[call](#)]
- Google DeepMind Scholarship (2020 - 2022) [[UCLA News](#)]
- University of California, Santa Cruz, Undergraduate Dean's Award (2014 - 2018)

RELEVANT SKILLS

- Languages: Python, R, JavaScript, PHP, Postgres, SQL, C++, Probabilistic Programs (Gen, Pyro, WebPPL)
- Libraries: TensorFlow, PyTorch, Jax, PyTorch.Geometric, SciKit Learn, OpenCV, Pandas, Numpy, ThreeJS
- Coursework: Statistical Modeling and Learning, Matrix Algebra & Optimization, Machine Learning, Probabilistic Decision Making, Visual Communication, Cognitive Artificial Intelligence, Neural Networks and Deep Learning, Automated Reasoning, Data Mining, Algorithms and Complexity, Operating Systems, Artificial Life for Graphics & Vision, Probability Theory, Probability Theory, R programming, Research Design and Analysis, Generative Models, Types and Programming Languages

EXPERIENCE

Applied Scientist Intern, Microsoft

Jun 2024 - Jun 2025

PRogram Synthesis by Example (PROSE) Research Team, Excel, Office Product Group

- Designed and implemented a Vision-Language Model (VLM)-based framework for extracting structured tabular data from images; integrated into Microsoft Excel, enabling large-scale deployment across Office products.
- Developed an LLM-driven table repair algorithm, significantly improving last-mile accuracy in image-to-table conversion.
- Conducted large-scale experimentation with state-of-the-art Multi-Modal models, including training and fine-tuning for Image-to-Code tasks.
- Applied multi-agent LLM system design principles to enhance robustness and adaptability in real-world scenarios.
- Performed statistical analyses of model performance, generating insights that directly influenced product design and feature rollout decisions.
- Authored technical reports and publications documenting methodologies, empirical findings, and novel approaches to multimodal learning.
- Delivered optimized research prototypes and experimental pipelines, ensuring reproducibility and scalability of results

Mathematics of Intelligences, Institute of Pure and Applied Mathematics, UCLA

Sep 2024 - Dec 2024

Core Participant

- Engaged in research discussions, seminars, and collaborative projects on *Search, Architecture, and Evaluation of Large Language Models*; *Concept Learning in Humans and Machines*; and *Group Theory and Representation Learning*.
- Contributed to a white paper and presented preliminary research findings

Mentee, NeuroSymbolic AI Research

May 2023 - Present

Mentor: Sumit Gulwani, Microsoft Research [[webpage](#)]

Graduate Research Assistant, Visual Intelligence Lab, UCLA

Mar 2021 - Dec 2024

Principal Investigator: Tao Gao

- **Researching and building models for joint vision-language learning using NeuroSymbolic methods (towards PhD dissertation)**
- Lead writing an ONR grant proposal for “Human-inspired Computational Models of Vision-Language Interactions for Agents” under faculty guidance (Tao Gao, Josh Tenenbaum) and received funding for 2023-2026 [\[call\]](#)
- Advising undergraduates, leading lab meetings on modeling work in Deep Learning and NeuroSymbolic Learning
- Investigated the role of structured program representations in concept learning (M.S. thesis available upon request)
- Implemented inverse planning algorithm for goal understanding using forward search and backward Bayesian Inference for a kitchen domain task (3D visual [VirtualHome](#) environment)

Mentee, Google DeepMind Scholar

Aug 2020 - Dec 2023

Mentor: Peter Battaglia, Google DeepMind [\[webpage\]](#)

Software Engineer, MIT Media Lab, Tangible Media Group, Cambridge, MA

Dec 2019 - Aug 2020

Principal Investigator: Hiroshi Ishii

- Applied deep learning techniques to 3D knitwear images to automatically generate knitting machine instructions
- Designed 3D knitwear on CAD tools and fabricated on a Shima Seiki WholeGarment MACH2XS machine
- Designed web-based Google Street View tool for user's to experience local art and sense ambient olfactory and sound stimuli in Lagos, Nigeria (for Google Arts & Culture in collaboration with photographer Stephen Tayo) [\[video\]](#)
- Designed web-based CAD tool to design & simulate behavior of a pressure actuated artificial muscle fiber [\[code\]](#)[\[paper\]](#)

Software Engineer, MIT Human-Centered Artificial Intelligence, Cambridge, MA

Aug 2018 - Dec 2019

Advisor: Lex Fridman

- Developed deep learning and computer vision algorithms for a real-time driver monitoring system to measure cognitive load using pupil and blink data [\[paper\]](#)
- Developed web-based annotation tools with database backend to streamline large-scale data collection, annotation and validation of raw video and image data of human faces, pupil and blinks [\[code\]](#)
- Developed a simulation tool in Python to analyze human driving behavior in parking scenarios using GPS data
- Developed a system to assign road-type labels to large-scale raw GPS data of driving routes
- Produced insights through exploratory data analysis of driver emotions in Veoneer self-driving scenario

Research Assistant, Re-Embodied Cognition Lab, UC Santa Cruz, CA

Feb 2017 - Mar 2018

Principal Investigator: Leila Takayama

- Developed a Python-based text-to-speech interface for Beam telepresence robots to aid wizard-of-oz experiments [\[code\]](#)
- Assisted in designing human-robot interaction experiments to measure human loneliness and social connectedness

Software Engineering Intern, Folium LLC, Mountain View, CA

Jun 2017 - Aug 2018

Advisor: Jeff Capone

- Developed a machine learning model to detect biological sex of users from wearable EKG data

Research Assistant, Computer Vision Lab, UC Santa Cruz, CA

Jun 2016 - Dec 2016

Advisor: Roberto Manduchi

- Developed a gaze-contingent on-screen magnifier in C++ using Tobii Pro to allow touch-free interaction with screen

Research Assistant, NASA Undergraduate Student Instrument Project, UC Santa Cruz, CA

Jun 2016 - Jun 2017

Principal Investigator: David Smith [LAFTR Team in [NASA news](#)]

- Developed an understanding of lightning thunderstorms causing gamma ray emissions in the atmosphere
- Led a team of undergraduate researchers to manage, present to NASA, and build a plastic scintillator based detector to observe terrestrial gamma-ray flashes from thunderstorms
- Simulated passage of thunderstorm particles through gamma ray detector

TEACHING FELLOW

University of California Los Angeles

Statistics 13 Introduction to Statistical Methods for Life and Health Sciences	Apr 2025 - Jun 2025
Statistics 101A Introduction to Probability	Jan 2025 - Mar 2025
Statistics 100A Introduction to Probability	Apr 2024 - Jun 2024/Sep 2025 - Dec 2025
Statistics 10 Introduction to Statistical Reasoning	Sep 2023 - Dec 2023
Communication 188C AI & Society	Mar 2022 - Jun 2022
Communication 122 Visual Communication	Sep 2021 - Dec 2022
Computer Science 31 Introduction to Computer Science	Jun 2021 - Aug 2021/Jan 2022 - Mar 2022
Los Angeles Computing Circle, Instructor	Jul 2021

Massachusetts Institute of Technology

6.S094 Deep Learning for Self-Driving Cars , Teaching Assistant	Feb 2022 - Apr 2022
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JOURNAL ARTICLES

- Stacy, Stephanie, Siyi Gong, **Aishni Parab**, Minglu Zhao, Kaiwen Jiang, and Tao Gao. "A Bayesian theory of mind approach to modeling cooperation and communication." *Wiley Interdisciplinary Reviews: Computational Statistics*: e1631. [[PDF](#)]

PEER REVIEWED CONFERENCE PROCEEDINGS

- Ding, Li, Jack Terwilliger, **Aishni Parab**, Meng Wang, Lex Fridman, Bruce Mehler, and Bryan Reimer. "CLERA: A Unified Model for Joint Cognitive Load and Eye Region Analysis in the Wild." *ACM Transactions on Computer-Human Interaction* (2023). [[PDF](#)]
- Stacy, Stephanie, **Aishni Parab**, Max Kleiman-Weiner, and Tao Gao. "Overloaded communication as paternalistic helping." In *Proceedings of the Annual Meeting of the Cognitive Science Society*, vol. 44, no. 44. 2022. [[PDF](#)]

PREPRINTS

- **Parab, Aishni**, et al. "Analysis of Error Sources in LLM-based Hypothesis Search for Few-Shot Rule Induction." *arXiv preprint arXiv:2509.01016* (2025). [[PDF](#)]
- Mehrotra, Pronita, **Aishni Parab**, and Sumit Gulwani. "Enhancing creativity in large language models through associative thinking strategies." *arXiv preprint arXiv:2405.06715* (2024). [[PDF](#)]

POSTER PRESENTATIONS

- **Parab, A.**, Singh, M., Le, V., & Gulwani, S. (2024). DVLR: Disentangling Vision Language Representation for Image to Code. Institute of Pure and Applied Mathematics Long Program: Mathematics of Intelligences (IPAM-MOI), University of California, Los Angeles. Zenodo. [[PDF](#)]
- Barghi Sr, Majid Reza, Nicholas Delaney, Amirhossein Forouzani, Eric Wells, **Aishni Parab**, David Smith, Forest Martinez, Gregory S. Bowers, and John Sample. "Plastic Scintillator Based Detector for Observations of Terrestrial Gamma-ray Flashes." In *AGU Fall Meeting Abstracts*, vol. 2017, pp. AE33B-2555. 2017. [[abstract](#)]

INVITED TALKS

- **Parab, Aishni**. "Extracting Structured Data from Multi-Modal Input." *Workshop III: Naturalistic Approaches to Artificial Intelligence*, Mathematics of Intelligences Long Program, Institute for Pure and Applied Mathematics (IPAM), November 2024. Invited Talk. [[abstract](#)]. [[youtube](#)]

ACTIVITIES

University of California Los Angeles

August 2020 - Present

- IPAM Mathematics of Intelligences Core Member
- Neurosymbolic AI Reading Group
- Women in Math Group
- Statistics & Computer Science Graduate Student Association
- ACM AI & International Collegiate Programming Contest (ICPC)