

Umesh Kumar Singla

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EDUCATION

- 2020 - 2022 **University of California, San Diego (UCSD)**
M.S., Computer Science (GPA: 3.96/4.0)
Thesis: Exploration in Complex Naturalistic Behavior (defended 06/12/2022)
Advisor: [Dr. Marcelo Mattar](#)
- 2014 - 2018 **IIIT Hyderabad**
B.Tech., Computer Science & Engineering (GPA: 8.50/10.0)
Honors in Cognitive Science
Advisor: [Dr. Raju S Bapi](#)

EXPERIENCE

- 2023 - Present **Princeton Neuroscience Institute (PNI)**, Princeton University
Advisors: [Dr. Mala Murthy](#) and [Dr. Jonathan Pillow](#)
Position: Research Specialist
- Analysis and modeling of the female *Drosophila* behavior, with the aim of distinguishing between the predictable and volitional aspects of their decision-making process.
 - Apply state space models to infer discrete latent states governing the pose dynamics of *Drosophila* in a social setting.
- 2020 - 2022 **Department of Cognitive Science**, UC San Diego
Advisor: [Dr. Marcelo Mattar](#)
Position: Graduate Student Researcher
- Testing applicability of models of exploration and planning in reinforcement learning (RL) literature to animal behavior in sequential settings.
 - Modeling of choice behavior in bandit and 2AFC tasks using the frameworks of RL and bayesian hierarchical models in Stan.
- 2017 - 2018 **Brain, Cognition and Computation Lab**, IIIT Hyderabad
Advisor: [Dr. Raju S Bapi](#) and [Dr. Vinoo Alluri](#)
Position: Undergraduate Student Researcher
- Replicated a study on addiction-related alteration in resting-state functional connectivity in a different demographic sample.
 - Conducted a serial reaction time experiment using Psychtoolbox to study implicit sequence learning in auditory domain in human subjects.

PUBLICATIONS

- Submitted **Umesh Singla**, Marcelo Mattar. [Temporal persistence explains exploration of mice in a labyrinth.](#)
- 2023 Sharon Noh, **Umesh Singla**, Ilana Bennett, Aaron Bornstein. [Memory precision and age differentially predict the use of decision-making strategies across the lifespan.](#) *Scientific Reports*.
- 2020 Arun Garimella, **Umesh Singla***, Sourabh Rajguru*, and Vinoo Alluri. [Marijuana and the hippocampus: A longitudinal study on the effects of marijuana on hippocampal subfields.](#) *Progress in Neuro-Psychopharmacology and Biological Psychiatry*.

Conferences

2023	Shruthi Ravindranath, Umesh Singla , Junyu Li, Talmo Pereira, Jonathan Pillow, Mala Murthy. Inferring the latent structure that organizes naturalistic social behavior. <i>Neuroethology: Behavior, Evolution and Neurobiology, Vermont, United States.</i>
2018	Umesh Singla , Pramod Kaushik, Eduardo A. Garza-Villarreal and Vinoo Alluri. Replicating impaired resting state functional connectivity in chronic cocaine users. <i>5th Annual Conference of Cognitive Science (ACCS). IIT Guwahati, India.</i>
2017	Umesh Singla , Anuj K. Shukla and Bapi S Raju. Implicit sequence learning in auditory domain. <i>IIIT Hyderabad Undergraduate R&D Showcase.</i>

Talks

2023	Learning and Planning in RL . <i>The NorthCap University, New Delhi, India.</i>
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INDUSTRY

2018 - 2020	Machine Learning Engineer, Joveo, Inc. , Hyderabad, India <ul style="list-style-type: none">• Design, code, troubleshoot, and support scalable big data pipelines for the data science team. Technologies used were Spark, Airflow, AWS Athena, and Elastic Map-Reduce.• Develop a data-driven media planner to recommend the best platforms, locations, bid, and budget to advertise a job position.
Jun - Aug 2017	Software Intern, MacPorts, Google Summer of Code 2017 <i>Remote</i> <ul style="list-style-type: none">• Implemented the migrate command in Tcl and C to automate the end-to-end process of reinstalling macports and packages to ensure a smooth transition after an OS upgrade.
May - Jun 2017	Research Engineering Intern, Samsung Research <i>Bangalore, India</i> <ul style="list-style-type: none">• Analyze time-series data from CPU usage and network logs for anomaly detection.• Study fault localization methods to detect faulty operations in cloud systems at run time.

SKILLS

Programming	Python (PyTorch, JAX, PyStan, scikit-learn, Numpy, Pyplot), MATLAB, SQL
Others	Cloud (AWS/GCP), CI/CD, Git, Docker, Linux, JavaScript, REST

TEACHING ASSISTANT

UCSD

Fall 2021	CSE 250A: Probabilistic Reasoning and Decision-Making
Spring 2022	DSC 190: Intro to ML: Representation Learning
Winter 2022	DSC 102: Systems for Scalable Analytics
Summer 2022	CSE 8A: Intro to Programming in Python
Summer 2021	CSE 141: Intro to Computer Architecture
Spring 2021	CSE 142L: Computer Architecture Lab

IIIT Hyderabad

Spring 2018	ICS 251: Computer Networks
Spring 2017	IEC 103: Basic Electronic Circuits
Fall 2016	IEC 102: Electrical Science 1

VOLUNTEERING

2023 - present	Climate & Inclusion Committee, PNI
2022	Jacobs Undergraduate Mentoring Program graduate mentor, UCSD
2021	oSTEM Qtorship mentor, UCSD
2018, 2019	Google Summer of Code (GSoC) org admin and co-mentor for MacPorts .

AWARDS

2014 - 2015	Dean's List, IIIT Hyderabad
2014	INSPIRE Scholar, Department of Science and Technology, Govt of India

RELEVANT COURSEWORK

Princeton

Statistical Modeling and Analysis of Neural Data

UCSD

Probabilistic Reasoning and Decision-Making; Deep Generative Models
Search and Optimization; Probabilistic Machine Learning
Recommender Systems; Structured Prediction for NLP

IIIT Hyderabad

Statistical Methods in AI; Information Retrieval and Extraction
Intro to Cognitive Science; Intro to Neuronal Dynamics; Game Design; Language, Mind and Society
Discrete Mathematics; Linear Algebra; Probability and Statistics
Complexity and Algorithms; Distributed Systems; Software Design; Formal Methods