Aditi Chandrashekar

AI for Science

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EDUCATION

California Institute of Technology — Pasadena, California
B.S., Computer Science — 2021 – Present
Current GPA: 4.1/4
Thesis: "Generalizable and Robust Equivariant Learning to Solve Inverse Problems"
Advised by Dr. Bahareh Tolooshams and Professor Anima Anandkumar

EXPERIENCE

Computational Cameras Lab (Bouman Lab), Caltech — Pasadena, California
Undergraduate Researcher, *Advised by Brandon Zhao and Diego Royo* — Sept 2024–**Present**

- Reconstructing dark matter maps from poorly sampled astronomical data using a multi-modal variational diffusion model
- Achieved high fidelity reconstructions compared to CAMELS simulations

Anima AI + Science Lab (Anandkumar Lab), Caltech — Pasadena, California
Undergraduate Researcher, *Advised by Dr. Bahareh Tolooshams* — Sept 2023–**Present**

- Using neural operators to reduce acquisition time in Functional Ultrasound Imaging (fUS) for use in Brain Machine Interfaces
- Built and trained diffusion models for better recovery of signal from measurement in fUS and MRI
- Filtered and denoised datasets for frame-to-frame learning. Generated synthetic data

Allen Institute for Brain Sciences — Seattle, Washington
Arthur Rock SURF Fellow, *Advised by Dr. Mariano Gabitto* — Jun 2024–Oct 2024

- Leveraging lightweight transformer architectures to learn cellular representations of Alzheimer's Disease (AD) states
- Achieved state of the art performance on celltype annotation task (94% accuracy on RNA-Seq data alone)
- Preparing paper for submission.

ARCL Lab (Chung Lab), Caltech — Pasadena, California
Aerospace Corporation SURF Fellow, *Advised by Dr. Ben Riviere and John Lathrop* — Jan 2023–Aug 2023

- Built an autonomous testbed and controller for development of planning algorithms
- Developed control and planning algorithms for the Indy Autonomous Racing Challenge

AIMS Lab (Lee Lab), Paul G. Allen School, University of Washington — Seattle, Washington
William H. and Helen Lang SURF Fellow, *Advised by Dr. Nicasia Beebe-Wang* — Jul 2022–Sept 2022

- Implemented Explainable AI (XAI) techniques to learn relationships between gene expression data and AD neuropathology
- Resulting model exhibited a general improvement in prediction of AD neuropathology

SELECTED PUBLICATIONS/TALKS

A Unified Model for Compressed Sensing MRI Across Undersampling Patterns
Armeet Singh Jatyani, Jiayun Wang, Aditi Chandrashekar, Zihui Wu, Miguel Liu-Schiaffini, Bahareh Tolooshams, Anima Anandkumar

Submitted to CVPR 2025

Learning Biologically Meaningful Cellular Representations using Transformer Architectures
Aditi Chandrashekar, Mariano Gabitto
Poster, *SURF Seminar at Caltech/ Accepted at ISCB-LATAM SoIBio CCBCOL, 2024*

TabVI: Leveraging Lightweight Transformer Architectures to Learn Biologically Meaningful Cellular Representations
Aditi Chandrashekar, Rohan Gala, Andreas Tjärnberg, Saniya Khullar, Grace Huynh, Mariano Gabitto
In preparation.

Generating Synthetic Functional Ultrasound Data
Aditi Chandrashekar, Bahareh Tolooshams
Talk, *AI for Science Lab at Caltech, 2023*

Building an Autonomous Testbed for Motion Planning Algorithms on a modified RC Car
Aditi Chandrashekar, John Lathrop, Ben Rivière, Soon-Jo Chung
Talk, *SURF Seminar at Caltech, 2023*

Feature Selection using Explainable AI to Refine Associations between Prominent Genes and Alzheimer's Disease Neuropathology
Aditi Chandrashekar, Nicasia Beebe-Wang, Su-In Lee
Talk, *SURF Seminar at Caltech, 2022*

AWARDS

2024	Arthur Rock SURF Fellowship
	El Segundo Defense Tech Hackathon, Accepted
2023	Aerospace Corporation SURF Fellowship
2022	William H. and Helen Lang SURF Fellowship
2021	George P. Mayhew Scholarship
	Regeneron ISEF Finalist

TEACHING

2024 Spring-Present	Caltech LLM Club President
2024 Spring	Caltech CS 179 (GPU Programming) Teaching Assistant
2022-2023 Winter	Caltech CS 2 (Data Structures) Teaching Assistant
2022-Present	Caltech Peer Academic Coach (Calculus, Linear Algebra, Computer Science)

REFERENCES

Anima Anandkumar anima@caltech.edu
Bren Professor of Computing and Mathematical Sciences, Caltech

Bahareh Tolooshams btoloosh@caltech.edu
Postdoctoral Researcher, CMS Department, Caltech

Katie Bouman klbouman@caltech.edu
Associate Professor of Computing and Mathematical Sciences, Electrical Engineering and Astronomy, Caltech

Mariano Gabitto mariano.gabitto@alleninstitute.org
Assistant Investigator/ Affiliate Assistant Professor, Allen Institute for Brain Sciences/ University of Washington

Soon-Jo Chung sjchung@caltech.edu
Bren Professor of Control and Dynamical Systems, Caltech

Su-In Lee suinlee@uw.edu
Paul G. Allen Professor of Computer Science & Engineering, University of Washington