Aditi Chandrashekar

AI for Science

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EDUCATION

California Institute of Technology — Pasadena, California
B.S., Computer Science, Information + Data Science (Minor) — 2021 – Present
Current GPA: 4.1/4
Thesis: "Generalizable and Robust Equivariant Diffusion 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

EquiReg: Equivariance Regularized Diffusion for Inverse Problems
Bahareh Tolooshams*, **Aditi Chandrashekar***, Rayhan Zirvi*, Abbas Mammadov, Jiachen Yao, Chuwei Wang, and Anima Anandkumar
Submitted to NeurIPS 2025

VARS-fUSI: Variable Sampling for Fast and Efficient Functional Ultrasound Imaging using Neural Operators

Bahareh Tolooshams, Lydia Lin, Thierri Callier, Jiayun Wang, Sanvi Pal, **Aditi Chandrashekar**, Claire Rabut, Zongyi Li, Chase Blagden, Sumner Norman, Kamyar Azizzadenesheli, Charles Liu, Mikhail G. Shapiro, Richard A. Andersen, and Anima Anandkumar

Submitted to Nature Communications

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

CVPR 2025

Learning Biologically Meaningful Cellular Representations using Transformer Architectures

Aditi Chandrashekar, Mariano Gabitto

Poster, *SURF Seminar at Caltech/ Accepted at ISCB-LATAM SolBio 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.

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 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

Available upon request.