

Aditi Chandrashekhar

AI for Science

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EDUCATION

NYU, Courant Institute of Mathematical Sciences

PhD, Computer Science

Advised by Kyunghyun Cho, Eero Simoncelli, and Rob Fergus

New York, NY

2025 – Present

California Institute of Technology

B.S., Computer Science, Information + Data Science (Minor)

GPA: 4.1/4

Pasadena, CA

2021 – 2025

Thesis: "Generalizable and Robust Equivariant Diffusion to Solve Inverse Problems"

Advised by Bahareh Tolooshams and Anima Anandkumar

EXPERIENCE

Anima AI + Science Lab (Anandkumar Lab), Caltech

Undergraduate Researcher, *Advised by Dr. Bahareh Tolooshams*

Pasadena, CA

Sept 2023–Sept 2025

- Built diffusion models for recovery of signal from measurement in Functional Ultrasound (fUS) and MRI images
- Created framework for equivariance regularization in diffusion sampling to better solve inverse problems (EquiReg)

Computational Cameras Lab (Bouman Lab), Caltech

Undergraduate Researcher, *Advised by Brandon Zhao and Diego Royo*

Pasadena, California

Sept 2024–Mar 2025

- Reconstructing dark matter maps from poorly sampled astronomical data using multi-modal diffusion models

Allen Institute for Brain Sciences

Arthur Rock SURF Fellow, *Advised by Dr. Mariano Gabitto*

Seattle, WA

June 2024–Oct 2024

- Built 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)

ARCL Lab (Chung Lab), Caltech

Aerospace Corporation SURF Fellow, *Advised by Dr. Ben Riviere and John Lathrop*

Pasadena, CA

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

William H. and Helen Lang SURF Fellow, *Advised by Dr. Nicasia Beebe-Wang*

Seattle, WA

July 2022–Sept 2022

- Investigated relationships between gene expression and AD neuropathology using Explainable AI techniques
- Incorporating this feedback resulted in an improvement in the prediction of AD neuropathology

PUBLICATIONS

EquiReg: Equivariance Regularized Diffusion for Inverse Problems

Bahareh Tolooshams*, Aditi Chandrashekhar*, Rayhan Zirvi*, Abbas Mammadov, Jiachen Yao, Chuwei Wang, and Anima Anandkumar

Building Physically Plausible World Models at ICML 2025, Submitted to ICLR 2026

A Unified Model for Compressed Sensing MRI Across Undersampling Patterns

Armeet Singh Jatyani, Jiayun Wang, **Aditi Chandrashekhar**, Zihui Wu, Miguel Liu-Schiaffini, Bahareh Tolooshams, Anima Anandkumar
CVPR 2025

VARS-fUSI: Variable Sampling for Efficient Functional Ultrasound Imaging using Neural Operators
Bahareh Tolooshams, Lydia Lin, Thierry Callier, Jiayun Wang, Sanvi Pal, **Aditi Chandrashekhar**, 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

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

TALKS & POSTERS

Using Multi-Modal Diffusion Models to Reconstruct Dark Matter Fields
Aditi Chandrashekhar^{*}, Saumya Chauhan^{*}, Eshani Patel^{*}, Maria Vazhaeparambil^{*}
Lightning Talk, *MIT URTC 2025*

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

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

Feature Selection using XAI to Refine Associations between Prominent Genes and AD Neuropathology
Aditi Chandrashekhar, Nicasia Beebe-Wang, Su-In Lee
Talk, *SURF Seminar at Caltech, 2022*

AWARDS

- 2024 Arthur Rock SURF Fellowship
- 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.