CHINMAYEE ATHALYE

Personal Website | Github | LinkedIn | Google Scholar

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4th year Bioengineering PhD student with expertise in developing deep learning methods for multimodal biomedical data. **Seeking internship opportunities in AI for healthcare and biological systems.**

EDUCATION

University of Pennsylvania *2022 - 2027 (expected)*
Doctor of Philosophy (Ph.D.) in Bioengineering advised by Paul Yushkevich

University of California, Irvine *2018 - 2020*
Master of Science (M.S.) in Computer Science
Relevant coursework: Deep Generative Models, Probabilistic Learning, Statistical NLP, Neural Networks and Reinforcement Learning, Machine Learning

College of Engineering Pune (COEP), India *2014 - 2018*
Bachelor of Technology (B.Tech) in Electronics and Telecommunication Engineering

RESEARCH INTERESTS

Multimodal deep learning for biomedical applications, foundation models and transfer learning, generative models, data augmentation, large-scale optimization for scientific computing, AI for translational research

TECHNICAL SKILLS

Languages: Python, R, MATLAB, Bash

Machine Learning: PyTorch, TensorFlow, scikit-learn, pandas, NumPy, SciPy

Infrastructure: AWS EC2/S3, GCP, cluster computing (slurm and other CLI tools), Git, Docker

WORK EXPERIENCE

Graduate Researcher – PICSL Lab, University of Pennsylvania *Aug 2022 - present*
Working with Dr. Paul Yushkevich, Dr. David Wolk, Dr. David Irwin
Developing computational methods for multimodal postmortem brain imaging analysis

- Designed high-throughput tissue sampling protocols bridging wet lab methodology with computational analysis for implementing optimization-based multimodal registration (image alignment) algorithms
- Building deep learning pipelines to automate 2D-to-3D image alignment, reducing manual processing time from weeks to hours for quantitative pathology analysis and biomarker discovery

Data Scientist – Arnaout Lab, UCSF *Oct 2020 - Aug 2022*
Worked with Dr. Rima Arnaout, MD
Design and validation of machine learning models for large-scale clinical medical imaging datasets

- Developed and deployed deep learning pipelines for rare fetal heart disease detection in ultrasound images, focusing on domain-adaptive data augmentation strategies to enhance model robustness
- Created generative data augmentation methods combining anatomical features from clinical images, yielding 10,000+ new training samples which boosted recall for underrepresented classes by 6%
- Validated deep learning models across large-scale community clinical datasets (~750K images), conducting correlation analysis between model inputs and diagnostic outputs for clinical interpretability

Image Processing Intern – Carl Zeiss Meditec *May 2019 - Jul 2019*
Worked with Dr. Niranchana Manivannan and Dr. Garry Lee
Developed computer vision algorithms for use on commercial medical imaging devices

- Implemented U-Net for real-time optic nerve head detection in infrared retinal imaging, reducing processing time by 50% while maintaining clinical-grade accuracy for potential commercial device integration
- Evaluated explainable AI techniques (Grad-CAM, Integrated Gradients, GAIN) for neural network interpretability in medical diagnostic applications

Student Researcher – University of California Irvine *Jan 2019 - May 2020*
Computer Vision Research with Prof. Charless Fowlkes

Research Intern – ROSE Lab, NTU, Singapore *May 2017 - Jul 2017*
Worked with Dr. Dennis Ng and Prof. Alex Kot

SELECT PEER-REVIEWED PUBLICATIONS

See Google Scholar for a complete list

Operationalizing Postmortem Pathology-MRI Association Studies in Alzheimer's Disease and Related Disorders with MRI-guided Histology Sampling
C. Athalye, A. Bahena, ..., P. Yushkevich
Acta Neuropathologica Communications, 2025

Association of quantitative histopathology measurements with antemortem medial temporal lobe cortical thickness in the Alzheimer's disease continuum
A. Denning, ..., *C. Athalye*, ... P. Yushkevich
Acta Neuropathologica, 2024

Deep-learning model for prenatal congenital heart disease screening generalizes to community setting and outperforms clinical detection
C. Athalye, A. van Nisselrooij, S. Rizvi, M. C. Haak, A. J. Moon-Grady, R. Arnaout
Ultrasound in Obstetrics & Gynecology, 2023

Domain-guided data augmentation for deep learning on medical imaging
C. Athalye, R. Arnaout
PLOS One, 2023

Abandoned Object Detection Using Pixel-Based Finite State Machine and Single Shot Multibox Detector
D. Shyam, A. Kot, *C. Athalye*
IEEE International Conference on Media and Expo (ICME) 2018 - Oral Presentation (top 10%)

SERVICES & TEACHING

Reviewer - MICCAI 2025, CVPR DCAMI workshop 2024, Nature Scientific Reports, Wiley UOG

Teaching Assistant - Biomedical Image Analysis, Data Structures, Algorithms (5 courses, 2018-2025)

SELECT HONORS & AWARDS

J N Tata Endowment award for higher education	*2018*
Best Outgoing Student award by Alumni Association of COEP	*2018*
Women in Machine Learning (WiML) workshop travel grant	*2017*
National Talent Search (NTS) scholarship, Government of India	*2008-2018*