# CHINMAYEE ATHALYE

Personal Website | Github | LinkedIn | Google Scholar

**Contact:** chinmayee.athalye@gmail.com, cathalye@seas.upenn.edu

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

## 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, medical image registration, diffusion models, 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 & Medical Imaging:** PyTorch, TensorFlow, HuggingFace libraries, scikit-learn, pandas, SimpleITK, nibabel, ITK-SNAP, FreeSurfer, QuPath, openslide

**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 brain imaging analysis for neurodegenrative diseases

- Designed high-throughput tissue sampling protocols bridging wet lab methodology with computational analysis for implementing 3D to 2D MRI to histology multimodal registration algorithms
- Building deep learning pipelines to automate multimodal image registration and large-scale histology analysis for quantitative pathology analysis and biomarker discovery
- Contributing feature enhancements to PICSL open-source neuroimaging tools (histology annotation server, brainmold) to support broader research adoption

**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*