Aditya Jabade

(646)-382-3264 | aj3324@columbia.edu | linkedin/aditya_jabade | github/aditya_jabade

About Me

Innovative engineer and M.S. candidate in Applied Mathematics with a strong foundation in image processing, algorithm development, and deep learning. Experienced in building AI/ML solutions for healthcare, including digital pathology, medical device optimization, and advanced image-segmentation frameworks. Passionate about leveraging computational imaging techniques to tackle real-world problems and drive impact in translational research environments.

Technical Skills

Languages: Python (PyTorch, Tensorflow, NumPy, OpenCV, Scikit-learn, Pandas, Django), MATLAB, C
Technologies and Tools: UNIX, Git, Docker, MongoDB, LabVIEW, CST, DICOM, NIfTI

Work Experience

Oneirix Labs | Associate Engineer Pune, IN | Jun 2022 - Jun 2024

- **Medical Imaging & Image Registration:** Led a team in developing an optical-flow based Image-Registration algorithm using Scikit, OpenCV to test cosmetic product efficacy, achieving 96% overlay accuracy of periodically taken images. Managed project timelines, task allocation, and client meetings.
- **Digital Pathology & Microscopy:** Built an image-processing framework using OpenCV to segment and identify blood-cells from microscopic blood-smear images. Developed an ellipse detection algorithm leveraging NumPy to extract cell geometry for hematological parameter estimation, achieving 2x run-time improvement.
- **Algorithm Optimization & Data-analysis:** Implemented an infinity norm minimization-based regression algorithm using SciPy to enhance efficiency of a medical device. Created a Pandas-based parsing tool to extract and analyze operational data from 100+ device logs guiding 2 improvements in next-generation devices.

Hiroshima University | Research Intern Hiroshima, JP | Aug 2021 - Dec 2021

- Designed a data-driven PID controller in MATLAB for a nonlinear liquid level-control system achieving ~20% rise time improvement over classical PID controllers.

Academic Projects

Lung Tumor segmentation using U-Net Dec 2024 - Present

- Implementing a PyTorch-based U-Net for automated lung tumor segmentation in CT scans.
- Built a robust pre-processing pipeline (normalization, data augmentation, oversampling) to address variability and class imbalance in the Medical Segmentation Decathlon (MSD) dataset.

Enhancing NYC Subway Announcements Using Audio Signal Processing Sep - Nov 2024

- Designed and implemented a noise-reduction system for NYC subway announcements using a high-pass Butterworth filter and Wiener filtering techniques, validated through spectrogram analysis on real-world audio samples.
- Explored source separation, Independent Component Analysis (ICA), and dereverberation techniques to enhance speech quality addressing acoustic challenges in noisy environments.

Education

Columbia University 4.0/4 New York, NY | Aug 2024 - Expected Dec 2025
M.S. Applied Mathematics
Coursework: Deep Learning in Biomedical Imaging, Medical Signal Modeling, Digital Signal Processing, Digital Image Processing, Numerical PDEs, Optimization Models and Methods

Birla Institute of Technology & Science Pilani - 8.84/10 Goa, IN | Aug 2018 - May 2022
B.E. Electronics & Instrumentation Engineering; Minor in Physics
Coursework: Control Theory, Industrial Instrumentation, Microelectronic Circuits, Digital Image Processing