Aditya Jabade

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Education

Columbia University 4.0/4 New York, NY | Aug 2024 - Expected Dec 2025
M.S. Applied Mathematics
Coursework: Digital Signal Processing, Medical Signal Modeling, Deep Learning in Biomedical Imaging, Computational Math, Optimization Models, Partial DIfferential Equations

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, Image Processing, Math modeling, Nonlinear dynamics, Probability and Statistics

Experience

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

- 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.
- 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.
- Implemented an infinity norm minimization-based regression algorithm using SciPy to enhance efficiency of a lithotripsy device. Created a Pandas-based parsing tool to extract and analyze operational data from 100+ device logs guiding 2 improvements in next-generation devices.
- Developed a framework to extract multimodal features from video data using OpenCV, PyTorch (ResNet and VGGish models) for scene-change boundary detection.

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.
- Conducted a literature survey on the theory of data-driven PID controllers and their advantages over other control-design techniques, with a focus on applications in nonlinear systems.

CEERI Pilani | Research Intern Rajasthan, IN | May 2020 - Jun 2020

- Conducted parameter estimation of a Brushless DC motor deployed in an electric tricycle and constructed its mathematical model in MATLAB.
- Developed a closed-loop control system for motor model in Simulink, utilizing classical methods, genetic algorithms, and fuzzy logic techniques to optimize the PID controller.

Academic Projects

Eliminating Child Care Deserts in New York State through Optimization New York, NY | Sep - Nov 2024

- Developed a linear integer optimization model using Gurobi, to address childcare deserts in New York by optimizing facility expansions and resource allocation under budget constraints, achieving a minimum feasible funding estimate of ~$350 million.
- Implemented fairness constraints and distance-based optimization to ensure equitable childcare access across regions to balance cost, coverage, and demographic requirements.

Design of a Metamaterial Radar Absorber Goa, IN | Aug - Dec 2020

- Designed a novel radar absorber with a low profile of 0.0739 wavelengths at its lowest operating frequency and a strong fractional bandwidth of 100.55 % from 3.13 to 9.46 GHz.
- Presented research findings at the 2021 National Conference on Communications held at IIT Kanpur.

Technical Skills

Languages: Python (NumPy, OpenCV, PyTorch, Scikit-learn, SciPy, Pandas, Django, Matplotlib), MATLAB, C
Technologies and Tools: Git, Azure, Docker, MongoDB, Simulink, Gurobi, LabVIEW, CST
Domains: Algorithm Development, Healthcare Technology, Image Processing, Computational Modeling