

# Aditya Hegde

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## Education

### San Jose State University

*Master of Science in Artificial Intelligence (GPA: 4.0)*

San Jose, CA

*Aug 2025 – May 2027 (Expected)*

### Woxsen University

*Bachelor of Technology in Computer Science Engineering (GPA: 3.73)*

Telangana, India

*Sep 2021 – May 2025*

*Dean's List: 8 semesters*

## Experience

### Data Scientist Intern

*SUHORA Technologies Pvt. Ltd.*

Mar 2024 – Jul 2024

*Uttar Pradesh, India*

- Developed a computer vision pipeline using object detection and segmentation models for maritime surveillance.
- Improved detection performance by over 40% mAP through model selection, data curation, and tuning.
- Processed 900+ SAR and Optical satellite images, maintaining over 95% evaluation accuracy.
- Decreased inference latency from 7 minutes to less than 1 minute, enabling near-real-time analysis.
- Collaborated with engineers to integrate models into internal workflows.
- Designed event-driven ingestion pipeline monitoring NAS volumes for high-resolution geospatial imagery (10,000 km<sup>2</sup> per image).
- Built hybrid C# + Python preprocessing system performing geometric correction, normalization, uint8 compression, and tiling for distributed GPU inference.
- Implemented parallel worker architecture executing inference on dedicated GPU server with runtime memory guards and detection overflow controls.
- Engineered in-memory reconstruction and overlap-aware postprocessing pipeline producing GIS-compatible GeoJSON outputs.
- Stress-tested system on 15B pixel batch workloads; achieved 45s processing time per 10,000 km<sup>2</sup> image.
- Integrated structured logging + automated exception reporting with system resource snapshotting for rapid debugging.

### Research Assistant

*Woxsen University*

Aug 2023 – Feb 2024

*Telangana, India*

- Improved video frame interpolation models, increasing inference speeds by 28.5% while improving PSNR and SSIM scores.
- Evaluated federated learning frameworks across 10+ edge devices, reducing convergence time by 15%.
- Compared centralized vs distributed training, reducing communication overhead by 50% without accuracy loss.
- Implemented end-to-end data processing pipelines in Python to handle 50K+ medical, satellite, and environmental records across different applications, enabling scalable multi-domain data integration.
- Developed modular code blocks in PyTorch and OpenCV for reusable workflows with data preprocessing, training, validation, and evaluation.
- Applied version control and collaborative development practices using Git, coordinating with multidisciplinary teams to deploy and refine experimental pipelines.

## Projects

### Marine Debris Detector | *PyTorch, Computer Vision, Git, Docker*

Apr 2025

- Engineered an end-to-end pipeline processing 1000+ Sentinel-2 and PlanetScope images for debris detection.
- Trained CNN-based models achieving over 90% validation accuracy and +15% precision over baseline approaches.
- Designed a rule-based geospatial fallback system (NDWI, NDVI, FDI) to cut down compute cost while maintaining detection reliability.
- Implemented batch inference and structured result serialization in Python to support downstream automation and programmatic analysis.
- Built a backend with Flask and Front-end with React; Built REST APIs for the backend with JSON request/response pipelines.

- Included an endpoint to generate a vector visualisation of detections for download and inspection, compatible with GIS software like QGIS and ArcGIS.
- Containerized inference pipeline using Docker for reproducible deployment.

#### Seg2Box Annotation Tool | *PyTorch, Algorithm Design, Git*

Nov 2024

- Developed an automated annotation conversion tool improving quality for vision datasets.
- Designed a deterministic, multi-stage annotation pipeline with structured inputs and outputs, enabling fast downstream automation (<1 ms per JSON).
- Replaced traditional IoU logic with IoMin-based matching, increasing annotation precision by 13%.
- Reduced preprocessing time by 40%, improving downstream efficiency.
- Packaged as a reusable Python module for dataset preprocessing.

#### Denoising Autoencoder | *PyTorch, Git, Python, OpenCV*

Dec 2025

- Led a team of 12 working on a project to denoise a wide range of imagery types, dividing into 3 sub-teams and managing all 3.
- Taught and upskilled the team as development continued.
- Used GitHub Actions and production grade branch control and development practices.
- Developed our own lightweight custom deep learning CNN autoencoder architecture, achieving over 35 PSNR and 0.95+ SSIM score.
- Presented at the AI&ML Club project presentations, receiving recognition as 2nd best project of the semester by Computer Vision focused faculty.
- Lightweight model architecture and data processing optimizations (model pruning, quantization, data type consistency) allowed sub-30ms inference times per 512x512 image.

### Technical Skills

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**Languages:** Python, HTML/CSS, JavaScript

**ML/Data:** Machine Learning, Deep Learning, PyTorch, Tensorflow, Transformers, Scikit-Learn, OpenCV, Keras

**Frameworks:** Flask, Django, ReactJS, ExpressJS, Tailwind CSS, Node.js

**LLM/AI Tools:** HuggingFace, OpenAI API, Gemini, Claude, LLM Integration

**Tools:** Git, Docker, GCP, AWS (Lambda, EC2), PyCharm, VS Code, Linux

**Backend:** REST APIs, FastAPI, Flask, SQL

### Campus Involvement and Leadership

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#### Chief Projects Officer, AI&ML Club

Feb 2026 – Present

*San Jose State University*

*San Jose, CA*

- \* Recruited and leading a team of 8 project officers.
- \* Managing over 17 projects, spanning 70 active project members and multiple github repositories.
- \* Streamlined documentation and activity tracking, with consistent logs and transparency.
- \* Revised a template GitHub repository and outlined best practices for project development.
- \* Coordinated meetings and secured collaborations with companies for 5 industry-led projects done by the Club.

### PUBLICATIONS AND AWARDS

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- A. Baggu, A. Hegde, H. Morayya, S. A. Yallapragada, and H. Mazumdar, “Machine Learning-Based Space Risk Management: Asteroid and Solar Flare Prediction,” 2024 IEEE 3rd International Conference on Electrical Power and Energy Systems (ICEPES), Bhopal, India, 2024, pp. 1–6, doi: 10.1109/ICEPES60647.2024.10653497.
- Baggu, A., Hegde, A., Morayya, H., Kumar, L., Sattarapu, P., Yallapragada, S.A. (2026). “Deep Learning Based Dementia Detection on MRI Data.” In: Pal, S., Malhotra, S., Gupta, I., Kumar, A. (eds) Emerging Technology and Sustainable Solutions. ICETSS 2024. Communications in Computer and Information Science, vol 2610. Springer, Cham. doi: 10.1007/978-3-032-11488-4\_15