

# ADITYA KULKARNI

San Jose, CA

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| US Citizen | Authorized to work in the US |

## Education

University of Illinois Urbana-Champaign

August 2024 – December 2025

Master of Computer Science | **GPA: 3.85/4**

Urbana, Illinois

**Relevant Coursework:** Distributed Systems, Artificial Intelligence, Database Systems, Cloud Computing

Pune Institute of Computer Technology

July 2020 – July 2024

Bachelor of Engineering in Computer Engineering | **GPA: 3.7/4**

Pune, India

**Relevant Coursework:** Data Structures and Algorithms, Object Oriented Programming, Machine Learning

## Technical Skills

**Languages:** Python, Java, Golang, SQL, C++

**Frameworks & Libraries:** Node.js, Flask, Express.js, OpenCV, TensorFlow, Keras, PyTorch, Scikit-Learn, React.js

**Databases, Tools & Technologies:** MySQL, MongoDB, AWS (EC2, S3, Lambda, DynamoDB), Docker, Git, REST APIs, Postman, CI/CD, Linux/Unix

## Experience

NASA Jet Propulsion Laboratory

May 2025 – September 2025

Machine Learning Intern

Los Angeles, California

- Designed and implemented a **250K-system synthetic exoplanet dataset generation pipeline** using **in-situ formation modeling** and **observational bias simulation**.
- Developed and trained **Support Vector Machine (SVM)**, **Deep Residual Multi-Layer Perceptron (MLP)**, and **Attention-based Gated Recurrent Unit (GRU)** models for **binary classification of habitable planet presence** from engineered statistical system features.
- Deployed and evaluated models on **Kepler mission datasets**, identifying **15% of systems** as potential hosts of **undetected habitable planets**.

L3 Cube (PICT Linux User group)

August 2023 – August 2024

Research & Project Intern

Pune, India

- Implemented a **dynamic programming algorithm** for **precise answer span extraction** across **10 low-resource Indic languages**.
- Built a **scalable multilingual data generation pipeline** to support **dataset creation** across multiple Indic languages.
- Spearheaded research on **automated assessment of multi-modal answer sheets in STEM domain**, designing **diagram evaluation methods** using **CRAFT** and **LLMs**.

Periwinkle Technologies Pvt. Ltd.

January 2023 – June 2023

Software Intern

Pune, India

- Developed a **Convolutional Neural Network (CNN)** model to detect **surface scratches** on proprietary glass components, achieving **78% classification accuracy**.
- Implemented an **end-to-end machine learning pipeline** integrating **automated model inference**, **image storage**, and **data management**.

## Projects

RAG Chunking Strategy Optimization | *Python, Langchain, LLaMA-3.1*

January 2025 - April 2025

- Built a **Retrieval-Augmented Generation (RAG)** evaluation pipeline to benchmark **fixed-size, semantic, and sentence-based chunking strategies** across top embedding models (**BGE, MiniLM, E5**) and **QA datasets (SQuAD, NQ)**.
- Integrated **FAISS, LangChain, and LlamaIndex** to **optimize retrieval workflows**, evaluating **accuracy-efficiency trade-offs** and identifying **fixed-size with overlap** as the most robust default strategy.

High Throughput Distributed System | *Golang, Distributed Systems*

August 2024 - December 2024

- Built a **distributed system from scratch in Go**, deploying on a **10-VM cluster** with **data sharding, SWIM-based membership, gossip-driven failure detection, and fault-tolerant replication**.
- Developed **HyDFS**, a **quorum-replicated distributed file system** with **DHT-based indexing, totally ordered merges, and read-my-writes consistency**, ensuring **high availability and reliable data replication** under node failures.

GraderGuru | *Pytorch, YOLOv5, Mistral Ai LLM, FastApi*

November 2023 - April 2024

- Led the development of a **machine learning pipeline** for **automated identification, analysis, and grading** of diagrams in STEM answer sheets, integrating **YOLOv5** with **Azure OCR** for **end-to-end processing**.
- Implemented a **LLM-based evaluation framework** to assess **diagram accuracy and quality**.