PULKIT SARDANA

Software Engineer (SDE) · Backend & Systems · B.E. Computer Science, 3rd Year

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SUMMARY

Software Engineer with hands-on experience building end-to-end systems, backend pipelines, and production-grade applications. Proficient in Python, C++, REST API development, and object-oriented design. Strong foundation in data structures and algorithms, system design, concurrency, and microservices architecture. Hands-on with AWS (EC2, S3), Docker, CI/CD workflows, and Linux shell scripting. Experienced deploying scalable cloud infrastructure and integrating ML models into production-ready software systems.

EDUCATION

B.E. – Computer Science and Engineering, RV Institute of Technology and Management, Bengaluru *2023 – 2027 · CGPA: 7.338*

PROJECTS

Solvix: Solar Panel Defect Detection System | Python · OpenCV · PyTorch · NumPy *2026*

IEEE Research (Resubmission in Progress) · github.com/PulkitSardana/solar-panel-fault-detection

- Designed and implemented an end-to-end computer vision pipeline in Python processing 6,493 real-world aerial RGB images across 4 defect classes — production-style data ingestion, annotation parsing, and classification using OOP architecture.
- Engineered a 13-dimensional feature extractor using NumPy and OpenCV; implemented a weighted k-NN classifier (inverse-distance, L2-normalized) with unit-tested modules, deployable without GPU infrastructure.
- Delivered **89.82% overall / 92.57% defect-only accuracy**; built a decision-support module mapping model outputs to severity ratings and prioritized maintenance actions.
- Benchmarked against 8 CNN/YOLO baselines; **optimized feature extraction pipeline reducing inference time by 30%** — documented trade-offs across accuracy, latency, and compute cost.

AD²-Restormer: Multi-Degradation Image Restoration | Python · PyTorch · AWS EC2/S3 · Linux *2025*

- Designed and implemented a Transformer encoder-decoder in PyTorch handling 4 adverse weather degradations (rain, fog, snow, haze); applied OOP design patterns for clean module separation across preprocessing, training, and evaluation.
- Automated training and inference pipelines on AWS EC2/S3 using Linux shell scripts; integrated systematic benchmarking across degradation types with reproducible evaluation metrics.

Intelligent Recommendation Engine | Python · Scikit-learn · Pandas · REST API *2024*

- Implemented a hybrid content-based + collaborative filtering system from scratch using OOP; end-to-end pipeline covering data ingestion, feature engineering, similarity embeddings, and iterative evaluation with unit tests.
- Exposed recommendations via a lightweight REST API endpoint; integrated with a frontend interface for real-time query and response handling.

TECHNICAL SKILLS

Languages: Python, C/C++, SQL, HTML, CSS

AI / ML & CV: Machine Learning, Deep Learning, Computer Vision, k-NN, Neural Networks, Scikit-learn, PyTorch, TensorFlow, OpenCV, Transformer Architectures, NumPy, Pandas, Matplotlib

Software Dev: Data Structures & Algorithms, OOP, System Design, Backend Development, Microservices, Concurrency & Multithreading, REST API Design, FastAPI, Flask, Unit Testing (pytest), Git, GitHub, Linux/Unix, CI/CD

Cloud / DevOps: AWS (EC2, S3), Docker, CI/CD Pipelines, GitHub Actions, MySQL, MongoDB, Google Colab, Jupyter Notebook

Engineering Tools: GitHub Projects, Notion, JIRA, Agile / Scrum, Sprint Planning, VS Code, Postman

CERTIFICATIONS

ML Specialization – Stanford / Andrew Ng (Completed) · **IBM Full Stack Developer** – Coursera (In Progress)

AREAS OF INTEREST

Software Engineering · Backend Systems · Distributed Systems · AI / ML Engineering · Computer Vision · Cloud Infrastructure · Open Source