TRUPT MANOJ ACHARYA

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EDUCATION

Master of Science, Computer Engineering - **New York University, New York** August 2023 - May 2025

- Achievements: Received Academic Scholarship
- Coursework: Internet Architecture & Protocols, Machine Learning, Big Data, Database Management Systems, Computer Vision

EXPERIENCE

IpserLab LLC, *Software Engineer Intern - Mountain View, CA* September 2025 - Present

- Building a real-time mobile application that utilizes computer vision to guide users in taking professional-quality photos via live feedback using **Flutter** and **Dart** for **cross-platform native performance**.
- Optimized the **computer vision pipeline** using **frame throttling, resolution downscaling, and background concurrency**, achieving 60 FPS UI rendering while maintaining 30 FPS inference accuracy on mid-range devices.

Dassault Systèmes, *Software Engineer Intern - Pune, India* June 2024 - August 2024

- Built an **edge-deployed NLP service** for air-gapped engineers using Flask, **quantized BERT**, and Docker to enable sub-1.5s local search across 2,000+ technical manuals.
- Added a **feedback loop** that **logged low-confidence predictions** to SQLite and incorporated **expert-reviewed corrections** into weekly retraining, **increasing** model precision by **30% in four iterations**.
- Containerized the service with Docker to **standardize dependency management**, reduced local setup time from 2 hours to 20 minutes, and **enabled adoption by three pilot teams**.

Scanpoint Geomatics Ltd, *Software Engineer - Remote, India* January 2021 - August 2023

- Led a team to build AgriVision, a production GIS platform for processing 50 GB per week of satellite data on AWS Linux collected while monitoring 15000+ hectares of harvest region.
- Designed the **full ML-to-maps pipeline** using YOLOv8/U-Net model for **crop health segmentation, PostGIS publishing**, and **React dashboard integration**.
- Built **Python automation** for data ingestion, tiling, and metadata normalization, **reducing manual preprocessing effort by 60%.**
- Solved a **critical labeling bottleneck** by developing **semi-automated Python tooling** for proprietary GIS software, accelerating annotation of 12,000+ instances by 20% and shortened model iteration cycles.

PROJECTS

TransitPulse – Distributed Real-Time Rail Telemetry System | Tech Stack: Python, Go, Kafka, Docker, Robot Framework

- Designed a microservices-based system simulating **safety-critical rail telemetry** using **Python FastAPI ingestor**, validated train data, and published to Kafka, while a **Go service enforced real-time rules** (e.g., "moving with doors open") with **sub-second alert latency**.
- **Containerized services with Docker** and **configured Kafka with dual listeners** (internal/external) to enable reliable host-to-container integration testing.
- Built a deterministic **Robot Framework test suite** with a custom Kafka library that scans topic history by **UUID**, ensuring 100% reliable verification of **critical fault detection** in **asynchronous environments**.

Public Affirmation Library | Tech Stack: TypeScript, React, PostgreSQL, Python, Docker

- Collaborated and deployed a **full-stack metal wellness platform** using Python (Flask), TypeScript, and PostgreSQL, supporting **1000+ concurrent users** with sub-second response times via **query optimization and Docker containerization**.
- Engineering **database architecture** in PostgreSQL with normalized schema, referential integrity, and stored procedures for **trending affirmations**, and **duplicate detection**, **improving load performance by 35%** under stress testing.
- Implemented secure, scalable features including anonymous posting, user favorites/responses, tag-based search, and role-based access control, with XSS/SQL injection mitigations via input sanitization and parameterized queries.

Scalable E-Commerce Platform | Tech Stack: Python (Flask), PostgreSQL, Docker, AWS, CI/CD

- Architected and deployed a **scalable e-commerce platform** using Flask (Python), React.js, PostgreSQL, and Redis, structured to handle **500+ concurrent users**, which is **validated via Locust load testing** with stable response times under peak traffic.
- **Optimized performance by 42%** through Redis caching and PostgreSQL indexing, while ensuring data consistency via inventory locking and transactional order workflow.
- Enabled PCI-compliant payments and end-to-end order lifecycle by **integrating Stripe API** with secure **webhook handling**.
- Cut CI/CD pipeline deploy time by containerizing the full stack with Docker and deploying it on **AWS with Nginx reverse proxy**.
- Achieved **98% backend test coverage** and **frontend validation** while simulating real-world edge cases using **Pytest and Jest**.

SKILLS

Languages:	Python, Java, JavaScript, TypeScript, SQL, C/C++, Go
Frontend:	HTML, CSS, React, Angular, React Native, Vue.js, Next.js
Backend:	Flask, FastAPI, ArcGIS JavaScript API, Node.js, gRPC, REST APIs, JWT
Databases:	PostgreSQL (PL/pgSQL), PostGIS, MongoDB, Redis, MySQL, SQLite
Cloud & DevOps:	AWS (EC2, S3), Docker, GitHub Actions, CI/CD, Locust
Testing:	Robot Framework (custom libraries), PyTest, Jest
Data Engineering:	Pandas, Numpy, Apache Spark, Apache Hive, Delta Live Tables (DLT), Kafka, Hadoop, Airflow
Machine Learning:	XGBoost, TensorFlow, PyTorch, Natural Language Processing (NLP), Computer Vision, MLOps, LangChain
Concepts:	Microservices, Event-Driven Architecture, Safety-Critical Systems, Real-Time Processing