Nandan Manjunatha

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SUMMARY

Senior Software Engineer with a passion for building **performant systems** that solve real-world problems. Brings a strong foundation in **Backend Engineering**, **Machine Learning**, and **Cloud**. Proficient in **Python** and **Go**, with hands-on experience using frameworks like **FastAPI**, **Flask**, and **Gin**, as well as tools such as **OpenCV**, **PostgreSQL**, **Docker**, **Kubernetes**, and **AWS**. Proven track record in designing and optimizing **scalable APIs**, **microservices**, and **AI-driven solutions** including Object Detection, OCR, and NLP applications. A lifelong learner who thrives on continuous growth, system design, and engineering at scale.

SKILLS

Programming Languages: Python, Go, C, C++, Shell, JavaScript
Web Frameworks: FastAPI, Flask, Django, Gin
Machine Learning: Scikit-learn, NLP, TensorFlow, PyTorch, Metaflow
Databases: PostgreSQL, MongoDB, MySQL, Redis
DevOps & Cloud: AWS, Docker, Kubernetes, CI/CD, GitHub Actions
Tools & Technologies: OpenCV, Pandas, NumPy, QGIS (GeoSpatial), Celery, MQTT

EXPERIENCE

Zeitview (DroneBase, Inc) Bengaluru, India
Senior Software Engineer I *Apr 2025 - Present*

- Engineered a custom **OCR(Optical Character Recognition)** system using **image processing** and **deep learning** in Python, reducing turnaround time by 70%.
- Wrote a Python script to interface with a LiDAR sensor via **serial (UART) communication**, parsing distance and angle data in real-time. And visualized 3D point clouds using Open3D.
- Adapted and implemented an algorithm to convert 360° fisheye images into **equirectangular** and **perspective** projections using OpenCV and geometric transformations in Python.
- Developed and maintained automation scripts and internal tooling in **Python** to enhance efficiency, reduce manual effort, and support strategic partnerships with global wind and renewable energy clients.

Software Engineer II *Jul 2024 - Mar 2025*

- Implemented **query optimizations**, **asynchronous processing**, and **caching strategies** to enhance response times and backend efficiency, reducing the average API response time to under 100ms.
- Architected and deployed high-performance backend RestAPIs leveraging FastAPI, PostgreSQL and Redis, achieving a **40% reduction in latency** through targeted **profiling**, **asynchronous processing**, and **query optimization**.
- Automate testing and deployment with **GitHub Actions CI/CD** pipelines triggered on code changes.
- Implemented a **Redis Pub/Sub** pipeline to asynchronously publish incremental batch processing outputs, enabling real-time frontend consumption and reducing blocking UI wait times.
- Built GeoSpatial image processing prototypes using **OpenCV**, **NumPy**, **GDAL** and **rasterio** to process satellite TIFF images >20GB, optimizing memory usage with tiling and batch pipelines.
- Led integration of third-party services including Auth0 **(OAuth2, JWT)** for secure authentication and **Procore** for project management via RESTful APIs.
- Set up a **pytest** test suite with fixtures, and mocking (unittest.mock, pytest-mock) to enable automated unit, integration, and end-to-end testing of FastAPI endpoints, enabling **Test-Driven Development (TDD)**.
- Followed **Agile methodologies**, collaborated with cross-functional teams, and contributed to design reviews, architectural decisions, and code quality standards.

Backend Engineer *Mar 2022 - Jun 2024*

- Architected the end-to-end **relational data model** for the application, optimizing for scalability, normalization, and query efficiency in **PostgreSQL**.
- Optimized PostgreSQL queries with **CTE** and **Materialized View**, resulting in a 20% improvement in data retrieval speed.
- Conducted performance profiling using cProfile, Py-Spy, and async-profiler, identifying latency bottlenecks in async endpoints and optimizing critical code paths.
- Took ownership of product development, contributing to major features and enhancements.
- Led migration of an application from **Flask** to **FastAPI**, enhancing performance and scalability.
- Developed automation tools and scripts in Python, improving workflow efficiency.

Digital Shark Technology Pvt. Ltd. Bengaluru, India

Machine Learning Intern *Aug 2020 - Nov 2020*

- Led R&D efforts as part of the core AI team, focusing on innovative solutions.
- Designed and implemented an end-to-end conversational AI chatbot, leveraging **transformer-based BERT model** and integrating with a **speech-to-text (STT)** and **text-to-speech (TTS)** engine using Coqui.ai.
- Developed and deployed a real-time **image classification model** on an **NVIDIA Jetson Xavier NX** using **TensorRT** and **ONNX Runtime**, optimizing the model graph for low-latency inference at the edge.
- Optimized model throughput using **FP16 quantization**, **layer fusion**, and **batch size tuning** during TensorRT compilation.
- Engineered a **wake-word detection model** using MFCC-based **feature extraction** on speech data and training a **Convolutional Neural Network (CNN)** for binary classification.
- Implemented the audio preprocessing pipeline using **Librosa** and **NumPy**, converting raw waveform data into 2D spectral representations suitable for CNN input.

EDUCATION

B.E in Computer Science and Engineering *2017-2021* | CGPA: 7.7/10
ACS College of Engineering, Bengaluru (aff. VTU).

CERTIFICATIONS

- Machine Learning in Production, DeepLearning.AI
- Deep Learning Specialization (5 courses), Coursera.
- Practical Machine Learning with Tensorflow, Indian Institute of Technology Madras.

COMMUNITY CONTRIBUTIONS

- Guest Lecturer on “Drone Technologies” at Dayananda Sagar Institute of Technology (Polytechnic), Bengaluru in 2022.
- GitHub: Contributed to open-source projects, so far earning 70+ stars and 20+ forks across all repositories.
- Stack Overflow: Earned 500+ reputation by solving technical challenges and providing solutions in python, computer vision, and database optimization.
- Personal Blog: a technical blog and portfolio at wirelog.net, sharing insights on software engineering, deep learning, and backend development.