Tamal Mallick

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Summary

Backend Developer skilled in designing scalable, high-performance APIs and microservices. Proficient in Python (Flask, FastAPI), Go (Fiber), and Node.js, with expertise in database optimization (SQL, MongoDB, Redis), server performance tuning (NGINX, Gunicorn, Uvicorn, Docker), and cloud deployments (AWS, Azure, DigitalOcean). Strong background in authentication, caching, and asynchronous processing. Passionate about solving backend scalability challenges.

Skills

Languages: Python, Go, JavaScript, SQL, C, C++, Java, Embedded C.

Backend : Flask, FastAPI, Go Fiber, Node.js, Microservices, API Design, RESTful APIs, WebSockets, API Testing (Postman).

Database : MySQL, PostgreSQL, MongoDB, Redis, Pinecone (Vector DB), Query Optimization, SQL performance tuning.

Cloud & DevOps : AWS (EC2, S3, Lambda), Azure, DigitalOcean, Docker, CI/CD, NGINX, Uvicorn, Linux, Load Balancing.

System Design & Scalability : Scalable Systems, Caching, Authentication (JWT, OAuth), Load Balancing, API Optimization.

Additional : Git, GitHub, Jupyter Notebooks, PyTorch, TensorFlow, YOLO, OpenCV, NLP, Pandas, NumPy, Scikit-Learn, Robotics.

Work Experience

Deep Learning Intern | *SERB (IIIT Kalyani)* | *Code Report Certificate*   Jun 2024 - Jul 2024

- **Skills Used: CNN, TensorFlow, YOLO, Jupyter Notebooks, NumPy, Pandas, Matplotlib, Satellite Image Processing**
- Processed 80GB+ INSAT-3D satellite data for cyclone intensity and track prediction.
- Fixed cyclone positioning using Mercator projection and optimized preprocessing with NumPy & Pandas.
- Developed deep learning models, achieving 99.6% accuracy in cyclone central pressure prediction.
- Recognized in the top 1% for sincerity, perseverance, and learning, attending 5–7 weekly reviews.

Education

Indian Institute of Information Technology (IIIT), Kalyani   Dec 2021 - May 2025
B. Tech. in Computer Science and Engineering   *CGPA: 8.3/10*
Key Coursework: DBMS, Operating Systems, Computer Networks, Cryptography, Object-Oriented Programming (OOPs), Data Structures and Algorithms, Probability and Statistics, Quantum Computing, Speech and Natural Language Processing.

Project Work

Python Search Engine | *Code Report Live*   May 2024 - Jan 2025

- **Skills Used: Flask, FastAPI, PyTorch, NLP, Hugging Face, Pinecone, Gunicorn, Nginx, Azure, CI/CD, API Scaling, Load Balancing**
- Built a Python-based search engine, scraping 400K+ URLs, refining 70K+ for optimized indexing with Pinecone API.
- Integrated NLP & sentence transformers for semantic search, deployed on Azure with Flask, Gunicorn & Nginx.
- Secured with custom domain, SSL, & CI/CD, optimizing query speed & backend performance.

OTPify – AI-Driven Fast OTP & Email Service | *Code*   Jan 2025 - Present

- **Skills Used: Go Fiber, FastAPI, Microservices, SQL, Redis, JWT, AI Automation, OpenAI API, Kafka, Docker, Kubernetes, CI/CD**
- Built a Go Fiber-based scalable OTP/email service with microservices, JWT-based auth & Redis caching.
- Designing an AI-driven fraud detection & rejection analysis system using FastAPI & LLM-based automation.
- Building backend infrastructure and user dashboard for real-time analytics and AI-driven email monitoring.

Task Management and Collaboration System | *Code Report*   Sep 2024 - Oct 2024

- **Skills Used: Python, Flask, REST APIs, MySQL, SQLite, Postman, Security, Role-Based Access Control (RBAC), Database Design**
- Designed a Flask-based backend with role-based permissions, REST APIs, & scalable SQL architecture.
- Ensured 100% API test coverage in Postman, optimizing performance & database queries.

AI-Powered Surveillance Vehicle | *Code Report Demo-1 Demo-2*   Jul 2024 - Dec 2024

- **Skills Used: C/C++, Async IO, Web API, Embedded Systems, Multi-threading, YOLO, PyQt, Postman, Real-time Streaming**
- Developed a C++ web server with REST APIs for remote control of motors, servos, & live video streaming.
- Built a PyQt desktop app integrating YOLO-based object detection & multi threaded video processing.

ReLearn - Edtech Platform | *Code Demo*   Jan 2023 - Mar 2024

- **Skills Used: React, Node.js, Express.js, MySQL, MongoDB, WebRTC, UI/UX, Video Streaming, File Sharing, DigitalOcean**
- Developed a React-based learning platform with video streaming, file sharing & WebRTC for live interaction.

Achievements and Certificates

- **LeetCode:** Solved 175+ problems using Python, demonstrating proficiency in DSA fundamentals and problem-solving.
- **Letter of Recommendation (Deep Learning):** Recognized for outstanding performance in a deep learning internship.
- **Reference (BTech Project Mentor):** Anirban Lakshman, Assistant Professor, IIIT Kalyani (Available upon request).