

Tamal Mallick

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Summary

Backend Developer skilled in scalable APIs, microservices, and system optimization. Proficient in Python (Flask, FastAPI), Go (Fiber), and Node.js (Express.js) with expertise in databases (SQL, MongoDB, Redis), performance tuning, and cloud deployments (AWS, Azure, DigitalOcean). Experienced in integrating AI into backend systems for optimized inference and data processing. Passionate about backend scalability and high-performance architectures.

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 (IIT Kalyani) | [Code Report](#) [Certificate](#)

Jun 2024 - Jul 2024

- **Skills Used:** CNN, TensorFlow, YOLO, Jupyter Notebooks, NumPy, Pandas, Matplotlib, Satellite Image Processing
- Processed 80 GB+ INSAT-3D satellite data, leveraging deep learning to improve cyclone intensity and track prediction.
- Corrected cyclone positioning using Mercator projection and optimized large-scale data preprocessing with NumPy & Pandas.
- Developed and fine-tuned deep learning models, achieving 99.6% accuracy in predicting cyclone central pressure.
- Studied extensively, engaged in 5–7 weekly reviews, and earned top 1% recognition for sincerity, perseverance, and learning.

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.
- **Finalist (Top 3) - Best Use of API:** [Secured top 3](#) in Best Use of API at StatusCode 0 Hackathon 2023 among 150+ teams.
- **Open-Source Contribution:** [Improved 4+ projects](#) in Hacktoberfest 2022 with key enhancements and critical bug fixes.
- **Reference:** [Dr. Anirban Lakshman](#), [Dr. Uma Das](#), Asst. Professors, IIIT Kalyani – Available upon request..