# Aranya Dutta

Backend Engineer | FastAPI • PostgreSQL •
Docker • Linux

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## Technologies

**Backend:** Python, FastAPI, REST APIs, JWT Authentication, RBAC
**Databases:** PostgreSQL (learning/implementing), SQL
**Deployment & Tools:** Docker, Docker Compose, Git, GitHub, Swagger/OpenAPI, Gradle
**Systems:** C, Linux, IPC, Kernel Modules, Bash

## Projects

**SafeShare Backend (Python • FastAPI • Cryptography)**   Project Link ↗
- Developing a secure file-sharing service using **FastAPI**, implementing **JWT (JSON Web Tokens)** for stateless authentication and **Bcrypt** for secure password hashing.
- Authored comprehensive technical documentation including **SRS, System Architecture, and Testing Plans**, following industry-standard SDLC practices.
- Designed a **Role-Based Access Control (RBAC)** system and middleware to protect sensitive API endpoints.
- **Technologies:** Python, FastAPI, JWT, Bcrypt, Docker, Swagger/OpenAPI

**CICFlowMeter API (Python • FastAPI • Docker)**   Project Link ↗
- Built a Dockerized REST API to process uploaded PCAP files using CICFlowMeter and return extracted network flow features as CSV files.
- Orchestrated execution of Java/Gradle-based CICFlowMeter from a FastAPI service, isolating heavy dependencies from the API layer.
- Implemented file handling, ZIP packaging, and controlled single-request execution to support large PCAP analysis workloads.
- Exposed interactive API documentation using Swagger UI for easy testing and integration.
- **Technologies:** Python, FastAPI, Docker, Java, Gradle, CICFlowMeter, PCAP, REST API

**KernelTalk (C • Linux Kernel • IPC)**   Project Link ↗
- Developed a Linux kernel module enabling multi-client communication via a custom character device (/dev/kerneltalk).
- Implemented producer–consumer synchronization using a circular buffer to handle concurrent read/write operations.
- Designed blocking and non-blocking I/O mechanisms to enable controlled kernel–user space communication.

**KataYomi — Chrome Extension (JavaScript)**   Project Link ↗
- Developed a Chrome extension (Manifest V3) that displays Hiragana readings for Katakana text on hover.
- Implemented Unicode-range detection (U+30A0–U+30FF) and custom conversion logic without external APIs.
- Designed a lightweight, non-intrusive tooltip system using DOM traversal techniques.

## Experience

**Open Source Contributor** • *Processing Foundation*   *Remote • June 2024 – Present*
- Contributed bug fixes to Processing 4, a Java-based environment used in global creative coding education.
- Managed workflows including issue tracking, branching, and pull requests via GitHub peer review.

**Competitive Programmer** • *KodeWreck*   *Bhubaneswar, India • Dec 2023 – Present*
- Current Codeforces Rating: **1234 (Pupil)** — Solved 450+ problems on GeeksforGeeks.
- Improved rating from 800 → 1234 within 6 months through consistent algorithmic practice.

## Achievements
- **2nd Runner-up** at ICDCIT Hackathon 2024 among 100+ participating teams.

## Education

**Kalinga Institute of Industrial Technology**   *August 2023 – May 2027*
*B.Tech in Computer Science*
- GPA: 7.92/10.0 — **Coursework:** Data Structures, Operating Systems, Computer Networks.
- **Skills:** Cisco Networking Academy, Japanese (JLPT N5 – Beginner).