Aranya Dutta

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Technologies

Languages: C++, C, Java, Python, JavaScript, HTML/CSS
Tools & Frameworks: FastAPI, Docker, Git, GitHub, JWT, Bcrypt, Gradle, Maven, Swagger
Systems/Hardware: Linux, ESP32, Embedded C++, Bash, Networking Basics, Pydantic

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

KataYomi — Katakana Hover Reader (Chrome Extension) Project Link

- Building a lightweight Chrome extension (**Manifest V3**) to assist Japanese learners by displaying Hiragana readings for Katakana text on hover.
- Implemented client-side Katakana detection by traversing DOM text nodes and matching specific Unicode ranges (U+30A0–U+30FF).
- Developed a custom translation logic using Unicode offset mapping for fast, dictionary-free conversion.
- Designed a non-intrusive tooltip overlay to display readings without disrupting original page layout.
- **Technologies:** JavaScript, Chrome Extension API, DOM Manipulation, Unicode Processing

KernelTalk (C • Linux Kernel • IPC) Project Link

- Built a Linux kernel module enabling multi-client terminal-based chat via a custom character device (/dev/kerneltalk).
- Implemented producer–consumer synchronization using a circular buffer to safely handle concurrent operations.
- Designed blocking and non-blocking I/O behavior to manage message flow across multiple user-space processes.
- Enabled kernel–user space communication using file operations (open, read, write) in C.
- **Technologies:** C, Linux Kernel, IPC, Character Device Drivers

WiFi-Controlled IoT Robotic Car (ESP32 • C++ • Embedded) Hardware Project

- Engineered a robotic vehicle using **ESP32**, establishing a low-latency socket connection over WiFi for real-time remote control via a laptop.
- Developed firmware in **C++** to handle motor driver logic and PWM signals for precise movement control.
- Integrated a communication protocol to parse keyboard inputs (WASD) into hardware-level execution commands.

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).