MUHAMMAD DAFFA MA'ARIF

Software Engineer • AI & Systems

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Summary

Computer Science undergraduate building at the intersection of applied AI, distributed systems, and high-throughput web telemetry. Experienced in delivering end-to-end software for industrial and research operations through engineering internships and academic labs, driven by systems reliability and product craftsmanship.

Education

Bachelor of Computer Science — *Universitas Pendidikan Indonesia | Sep 2023 – Expected Aug 2027*

Current GPA: ***3.81 / 4.00***

Key Experience & Contributions

Software Engineering Intern — *PT Bukaka Forging Industries | Apr 2026 – Aug 2026*

- **Press Automation Dashboard:** Built a real-time testing dashboard aggregating **100 Hz sensor streams** (load cell & laser displacement) via **Socket.IO and TimescaleDB** to automate engineering calculations for compressive strain and shear modulus.
- **Corporate 3D Web Platform:** Engineered an industrial B2B corporate web featuring interactive 3D seismic bearing (LRB) visualization using **Next.js 15, Three.js (R3F), and GSAP**, with a custom content API and admin panel deployed on Docker/VPS.
- **Mobile Audit Application:** Developed a cross-platform 5S patrol mobile app using **React Native (Expo Router) and Supabase**, automating weekly audit scheduling with operator rotations, role-based workflows, and photo verification.

Research Assistant – Data Engineering & Multimodal AI — *Universitas Pendidikan Indonesia | Jan 2026 – Aug 2026*

- **Cloud Data Pipeline:** Built an automated extraction pipeline on **Google Cloud (GCS & Cloud Run/Batch)** to process multimodal corporate governance and executive disclosure data from annual-report PDFs for financial research.
- **Computer Vision Pipeline:** Integrated **YOLO, OpenCV YuNet, ArcFace, and Meta SSCD** copy detection to detect, align, and deduplicate executive portraits with crop-resistant image matching algorithms.
- **AI Dataset Curation Portal:** Orchestrated **Google Gemini AI** for contextual title/name extraction and built a **Next.js 15** curation portal with interactive PDF cropping for dataset verification and cloud sync.

Fullstack Engineer – DINAMIK 20 — *Universitas Pendidikan Indonesia | Sep 2025 – Dec 2025*

- **System Architecture:** Designed a scalable database schema with **RBAC** (Admin, Judge, Participant) and automated email/WhatsApp notifications using **Next.js, TypeScript, and Supabase**.
- **Event Lifecycle:** Engineered end-to-end modules for **payment & QR ticketing, digital jury assessment, public voting, and submission tracking**, visualized through real-time statistical dashboards.

Selected Projects

Shorekeeper – Real-Time Voice AI & Multimodal Agent

- **Real-Time Voice Pipeline:** Architected sub-second duplex Speech-to-Speech over **WebRTC (LiveKit)**, integrating noise-gated turn-taking with **Groq Whisper large-v3**, **Hermes Agent WebSocket gateway** for autonomous tool orchestration, and 48kHz neural voice synthesis.
- **3D Audio-Reactive HUD:** Built a modern **Svelte 5 Web HUD** with an audio-reactive 3D particle visualizer (Three.js) powered by RFC 6464 audio telemetry, backed by an atomic **SQLite WAL** task store.

Applied Deep Learning & Intelligent Systems

- **Computer Vision & Reinforcement Learning:** Developed a biological classifier using **Transfer Learning (MobileNetV2)** and trained **Deep RL agents (PPO)** for autonomous simulated control tasks.
- **NLP & Predictive Modeling:** Benchmarked **Transformer vs. RNN/LSTM** architectures for conversational sequence modeling; engineered **XGBoost** fraud detection models optimized for highly imbalanced datasets.

Technical Skills

Languages: Python, TypeScript, JavaScript, Go, SQL, C/C++.

AI & Computer Vision: TensorFlow, Keras, OpenCV, Scikit-learn, Pandas, NumPy, YOLO, ArcFace.

Backend, Systems & Cloud: Node.js, Bun, Express.js, FastAPI, Docker, PostgreSQL, TimescaleDB, MongoDB, Cassandra, Google Cloud, Azure.

Frontend & Client Systems: React, Next.js 15, Svelte 5, Vite, Tailwind CSS, Three.js (R3F), GSAP, React Native (Expo Router).