RAYHAN AZIEL ABBRAR

Blockchain Architect | Systems & Compiler Engineer | Full-Stack Web3 Developer

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PROFESSIONAL SUMMARY

High-impact Systems Engineer and Blockchain Architect with deep technical expertise in Post-Quantum Cryptography (PQC), compiler design, smart contract escrow architecture, and modern full-stack development. Proven track record architecting a quantum-resistant Layer-1 blockchain in Go integrating NIST-standardized ML-DSA-87 and ML-KEM-1024 primitives, creating a full-stack JavaScript meta-framework (Ray.js) with fine-grained reactive signals and Zero Server Leak compiler isolation, and launching trustless Web3 escrow protocols on Avalanche C-Chain. Informatics undergraduate at Universitas Mercu Buana (GPA: 3.80/4.00), highly skilled in Go, Rust, TypeScript, Solidity, and Python, with a strong commitment to building censorship-resistant, high-performance decentralized systems.

TECHNICAL SKILLS

- **Programming Languages:** Go (Golang), Rust, Solidity, TypeScript, JavaScript, Python, Java, C++, SQL, x86 Assembly
- **Blockchain & Cryptography:** Post-Quantum Cryptography (ML-DSA-87 / Dilithium5, ML-KEM-1024 / Kyber1024), Fully Homomorphic Encryption (TFHE), Zero-Knowledge Proofs (ZKP), Smart Contract Escrow Architecture, Reentrancy Protection, Avalanche C-Chain, Ethereum (EVM), Solana (Anchor), Cosmos SDK, CometBFT, CosmWasm, IPFS, Web3.js, Ethers.js
- **Compiler & Runtime Engineering:** Custom AST Parsers, Lexer/Tokenizer, Single-File Component (SFC) Compilation, Fine-Grained Reactive Signals (No VDOM), Streaming SSR (Chunked Transfer), Hot Module Replacement (WebSocket HMR)
- **Frontend & Frameworks:** Next.js (App Router, Server Actions), Ray.js Meta-Framework, React.js, Tailwind CSS v4, Vue.js, Electron.js, HTML5/CSS3
- **Backend & Distributed Systems:** FastAPI, Java Spring Boot, Flask, Node.js, Express, Microservices, RESTful APIs, WebSockets, gRPC
- **Databases & Cloud Infrastructure:** PostgreSQL, MongoDB, Prisma ORM, Supabase, Cloudflare R2 / Workers, Redis, Docker, Linux/Unix, Git
- **AI, ML & Data Engineering:** Scikit-learn, Pandas, NumPy, PyTorch, Predictive Lap-Time Telemetry Modeling, Autonomous Multi-Agent Systems

FEATURED PROJECTS

Zytherion-PQC-Chain — Post-Quantum Cryptography Blockchain Protocol

Tech Stack: Go (Golang), Rust, ML-DSA-87, ML-KEM-1024, Cosmos SDK, CometBFT, TFHE, P2P | *github.com/Zytherion/Zytherion-PQC-Chain*

- Architected a custom Layer-1 blockchain protocol in Go designed to defend decentralized networks against quantum computer attacks, replacing classical ECDSA/RSA cryptography with post-quantum mathematical foundations.
- Implemented NIST FIPS post-quantum cryptographic standards: ML-DSA-87 (CRYSTALS-Dilithium5, NIST Category 5) for validator consensus signatures and ML-KEM-1024 (CRYSTALS-Kyber1024) with HKDF for secure P2P key encapsulation.
- Engineered a Fully Homomorphic Encryption (TFHE) engine leveraging Zama's tfhe-rs via CGo static linking, utilizing an OS-thread-pinned worker pool to execute concurrent encrypted arithmetic operations on-chain without mutex bottlenecks.

- Built a distributed shard storage network using Reed-Solomon Erasure Coding (12 data + 4 parity shards) and SHA-256 Merkle Tree integrity verification, accompanied by custom mining logic and an interactive block explorer.

Ray.js (Rayhan.JS) —Full-Stack JavaScript Meta-Framework

Tech Stack: TypeScript, Node.js, Custom AST Parser, Fine-Grained Signals, Streaming SSR, WebSocket HMR | github.com/zhao-leihan/Rayhan.js

- Created a modern full-stack web meta-framework introducing a Single-File Component (.ray) format that unifies server computation, client reactivity, declarative HTML templates, and scoped CSS into one cohesive modular file.
- Engineered a custom AST parser and Dual-AST compiler pipeline with Zero Server Leak protection, strictly isolating backend queries/secrets to Node.js while stripping private logic from browser client distribution bundles.
- Eliminated Virtual DOM diffing overhead by building an atomic fine-grained reactive signals engine that directly updates target DOM nodes on state mutation, substantially reducing memory and CPU overhead.
- Developed asynchronous streaming Server-Side Rendering (SSR) via HTTP chunked transfer encoding for instant TTFB, alongside automatic file-based routing, native REST API endpoints, dedicated dev server on port 7892, and multi-target compilation (Node.js & Cloudflare Workers).
- Published an official VS Code extension (.vsix) featuring custom syntax highlighting for 4-block .ray components, syntax validation, and visual branding assets.

GuideBloc — Decentralized Web3 Tourism Marketplace & Escrow Protocol

Tech Stack: Solidity, Avalanche C-Chain, Next.js, TypeScript, Java Spring Boot, MongoDB, NeonDB | github.com/zhao-leihan/GuideBloc

- Founded and engineered an on-chain travel marketplace connecting global tourists directly with verified local guides, eliminating traditional 25–35% agency intermediary fees down to a minimal protocol fee.
- Authored and deployed audited Solidity escrow smart contracts on Avalanche C-Chain with ReentrancyGuard, holding traveler deposits (USDT/USDC) in trustless escrow and releasing direct 90% payouts to guides upon multi-party milestone completion.
- Engineered a responsive Next.js web application with Web3 EVM wallet connectivity, backed by an enterprise-grade Java Spring Boot API gateway and MongoDB for high-concurrency booking state management.
- Implemented algorithmic search rankings in TypeScript preventing pay-to-win manipulation, real-time Supabase WebSocket messaging, and live GPS proof-of-meet coordination modules between tourists and local guides.

Trust Lesson — Decentralized Mentorship Platform with Portable On-Chain Reputation

Tech Stack: Solidity, Next.js, TypeScript, Tailwind CSS, Decentralized Identity (DID), Smart Escrow | https://github.com/zhao-leihan/Trust-Lesson

- Architected a decentralized P2P platform for booking career coaches, tutors, and technical consultants with automated session-based and milestone-based escrow payment smart contracts.
- Implemented a tamper-proof, permanent on-chain reputation protocol that cryptographically ties verified reviews and credentials directly to mentors' decentralized identities (DID), preventing platform lock-in and censorship.
- Designed a low-fee (5–8% vs. Web2 15–25%) dispute arbitration protocol utilizing a decentralized pool of staked, randomly selected jurors with automated evidence and attendance logging.

F1 Telemetry Analyzer (F1 Hub) — Race Telemetry & Predictive Analytics Platform

Tech Stack: Next.js, FastAPI, Python, Scikit-learn, Pandas, NumPy, PostgreSQL, IPFS, Sepolia Testnet | Live: f1-hub-nine.vercel.app

- Engineered an interactive Formula 1 telemetry platform providing granular cornering speed breakdowns, brake/throttle traces, and driver performance comparisons.

- Trained and deployed machine learning lap-time forecasting models using Scikit-learn, Pandas, and NumPy, served via an asynchronous FastAPI backend for high-speed inference.
- Implemented decentralized data integrity validation by storing telemetry datasets on IPFS and anchoring verification hashes onto Ethereum Sepolia testnet smart contracts.

EXPERIENCE & LEADERSHIP

Founder & Lead Project Architect: GuideBloc | *2025 – Present (Jakarta, Indonesia)*

- Spearheaded technical vision, decentralized architecture, smart contract security audits, and tokenomic design for the GuideBloc on-chain tourism escrow protocol.
- Pitched technical roadmap and product architecture in university and regional business competitions, securing 5th place in a blockchain innovation tournament.

Lead Software Architect & Creator: Ray.js Open Source Project | *2026 – Present (Jakarta, Indonesia)*

- Designed and maintained the core compiler architecture, runtime reactivity, and streaming SSR pipeline for the Ray.js open-source meta-framework ecosystem.
- Authored comprehensive intellectual property technical proposals and documentation for computer software copyright registration at Universitas Mercu Buana.

EDUCATION

UNIVERSITAS MERCU BUANA — West Jakarta, Indonesia

Bachelor of Science in Informatics (Computer Science) | GPA: 3.80 / 4.00 (Current 4th/5th Semester)

Relevant Coursework: Cryptography & Network Security, Distributed Systems, Data Structures & Algorithms, Database Systems, Object-Oriented Programming, Computer Networks, Software Engineering, Discrete Mathematics.

HONORS, COMPETITIONS & GRANTS

- **Business Case Finalist:** BRI GAMA International Business Case Competition (BRIGAMA IBCC 2026) — Team RS² | July – Aug 2026
- **5th Place Winner:** University Business Plan Competition (Blockchain & Cryptocurrency Track) | Sept 2025
- **Grant Applicant:** Solana Foundation Indonesia Grants for 'SolanaPay ID: Micro-payment POS for Indonesian MSMEs' | March 2026
- **Participant:** ESGI Dataset Business Plan Competition (ED-BPC 2025) with Team MBEX | Oct – Nov 2025
- **Participant:** FEB Strip Business and Prototype Competition with Team Azareth | April 2025