M. Alfa Ridzi,S.Mat
Fullstack Developer / Mathematician

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PROFESSIONAL SUMMARY

Senior Full-Stack Engineer and Product Architect with a strong mathematical foundation, specializing in system architecture, real-time systems, AI-integrated applications, and multi-tenant SaaS platforms across government, enterprise, and education sectors. Experienced in building chat systems, chatbot, encrypted communication platforms, educational games, clinical applications, and enterprise systems such as LMS, FMS, KMS, CRM, and ERM.

PT. Cartenz Technology Indonesia

Led development of government tax systems including tax analytics platforms, backend services for invoice generation, regulatory document processing using JasperReport and Spire.Doc, and complex reporting pipelines. Translated local government tax regulations into computational models for multi-sector tax calculation, alongside building geospatial mapping systems, GPS-based retribution platforms, and corporate web applications with extensive API integration.

PT. VADS Indonesia

Developed multi-platform field tracking systems (web and mobile) with real-time and offline-first architecture, enterprise knowledge management systems, learning management platforms, recruitment systems, analytics dashboards, and AI-powered chatbot solutions.

Primitif Learning & PT. Primaginary Teknologi Inovasi

Designed and built AI-integrated education and enterprise systems including learning platforms, automated assessment engines, chat and chatbot systems, and SaaS-based institutional solutions such as LMS, KMS, CRM, and ERM.

Freelance Software Developer

Developed a range of applications including educational games, economic and financial computation tools, and a clinical COVID-19 severity assessment system, along with various custom-built solutions based on client and domain-specific requirements.

Mathematics & Computer Science Educator

Served as a mathematics teacher and olympiad instructor from 2016 to 2022, teaching mathematics and computer science, and training students for competitive olympiad-level problem solving.

Experienced in designing and building maintainable, scalable systems with a strong emphasis on clean architecture, modular design, and integration of AI-driven components. Technical stack and implementation details are presented in the following sections.

Seeking a Senior Software Engineer, Technical Lead, or Application Architect role focused on building scalable and well-architected systems.

SKILLS

Technical Expertise

Full-stack engineering experience since 2018 with production-level involvement in backend systems, frontend, mobile platforms, and AI-driven applications.

- **Full-Stack Development**: React, Next.js (SSR/SSG), TypeScript, JavaScript (ES6+), Single Page Applications (SPA), React Native, Flutter, Kotlin (Android), Java (Android), PHP (Laravel, Native, CodeIgniter), Node.js (Express), Python (FastAPI, Flask), Java (Backend), RESTful API development, API integration, and full-stack application design across web and mobile platforms.

- **Scientific Computing & Math**: MATLAB, R (Statistical Computing), Python (NumPy, SciPy, Matplotlib), numerical computation, statistical analysis, algorithm design, computational modeling, and mathematical visualization including computational topology, with LaTeX for academic writing and scientific documentation.

- **Real-time Systems & Communication**: WebSockets (Socket.io), Supabase Real-time, PostgreSQL Listen/Notify, Firebase Real-time Database, real-time data streaming, event-driven architecture, bidirectional communication systems, real-time chat architecture, and GPS-based tracking systems.

- **Backend Architecture**: RESTful API design, microservices architecture, multi-tenant SaaS systems, authentication and authorization (JWT, RBAC), scalable backend design, service modularization, API integration (government and enterprise systems), and legacy system modernization.

- **Database Systems**: PostgreSQL, Supabase, MySQL, MariaDB, Oracle, SQL Server, Firebase, SQLite, including query optimization, indexing, performance tuning, relational database design, transaction handling, and data modeling.

- **System Design**: Scalable application architecture, clean architecture, SOLID principles, design patterns, enterprise ecosystem design, system modularization, separation of concerns, MVVM/MVC/MVI patterns, memory safety paradigms, and concurrency models (goroutines, async/await).

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- **AI & Analytics**: LLM-based chatbot development, NLP techniques (TF-IDF, VADER), neural search, sentiment analysis, applied machine learning, data analytics, feature engineering, and integration of AI models into production systems.

- **Mobile Engineering**: Offline-first architecture (Room/SQLite sync), real-time geolocation, performance optimization, memory management, multithreading, mobile application lifecycle, and cross-platform development (Android, Flutter, React Native).

- **Geospatial Engineering**: OpenLayers, spatial data processing, coordinate validation systems, GIS integration, map visualization, and geolocation-based system design, GoogleMaps API.

- **Document & Reporting Systems**: JasperReport, Spire.Doc, complex PDF generation, automated reporting pipelines, dynamic document generation, report templating, and enterprise reporting system integration.

- **DevOps & Tools**: Git, Docker, Firebase, CI/CD pipelines, environment configuration, build and deployment workflows, and Google Play Store deployment.

- **UI Engineering & Styling**: Vanilla CSS3 (Flexbox/Grid), Tailwind CSS, Bootstrap, SASS/SCSS, responsive web design (RWD), CSS animations (keyframes), web accessibility (a11y), and UI prototyping with Figma.

Programming Languages

- **Proficient**: Java, Kotlin, JavaScript (ES6+), TypeScript, PHP, Python, C/C++, Dart, MATLAB, R, with experience in object-oriented, functional, and asynchronous programming paradigms.

- **Learning / Familiar**: Go (Golang), C# / .NET, **Rust**, with ongoing exploration of systems programming and performance-oriented development.

Leadership & Product

- Technical leadership with end-to-end ownership of product architecture, including system design decisions, requirement engineering, code review, and long-term technical strategy.

- Cross-functional collaboration with product, business, and stakeholders, including mentoring, team development, and aligning engineering execution with product goals.

- B2B technical presentation, institutional pitching, and SaaS product positioning, translating technical systems into business-oriented solutions.

Languages

English (Professional Proficiency), Bahasa Indonesia (Native), Russian (Basic Reading) , Acehnese (Native Dialect)

TECHNICAL EXPERIENCE

PT. Primaginary Teknologi Inovasi (Primaginary Indonesia)   **Dec 2025 — Present**
Founder Chief Product Architect   *South Jakarta*
- Led strategic direction and end-to-end architecture of a multi-application education technology ecosystem.
- Architected scalable multi-tenant SaaS infrastructure and interconnected digital learning platforms.
- Engineered modular backend systems, automated grading, and dynamic question generation engines.
- **Technologies**: Node.js, PHP/Laravel, React/Next.js, MySQL, RESTful API Design, SaaS Architecture, System Design, Curriculum Engineering.

PT. Cartenz Technology Indonesia   **Feb 2024 — Nov 2025**
Assistant Supervisor – Full Stack Developer   *South Jakarta*
- Led full-stack development of government digital systems, including tax analytics, retribution management, and geospatial mapping platforms.
- Built backend services for tax data processing and invoice generation, integrating multiple government APIs using Java (Play Framework).
- Designed automated document generation and reporting systems using JasperReport and Spire.Doc.
- **Technologies**: Java (Play), PHP/Laravel, React/Next.js, JavaScript, OpenLayers, MySQL/MariaDB/Oracle, JasperReport, Spire.Doc, REST API Integration.

PT. VADS Indonesia   **Dec 2022 — Feb 2024**
Full Stack Developer   *South Jakarta*
- Developed multi-platform systems, including offline-first field tracking applications, knowledge management, and learning platforms.
- Built analytics dashboards, AI-driven chatbot systems, and automated recruitment workflows.
- Optimized backend architecture and data access patterns, implementing real-time communication via WebSockets.
- **Technologies**: PHP/Laravel, Java/Kotlin, Python, MySQL, React/Next.js, Docker, REST API, WebSockets.

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Primitif Learning — **Aug 2020 — Jan 2023**
Founder Lead Mobile Developer — *Banda Aceh*

- Founded and led the end-to-end development of an educational Android platform from conception to Google Play deployment.
- Designed system architecture and implemented a symbolic math equation solver engine.
- **Technologies**: Kotlin, Java, Firebase, Android SDK, System Architecture.

Symbolic Equation Editor — **Aug 2019 — Dec 2021**
Independent Developer — *Banda Aceh*

- Developed a STEM-focused equation editor featuring a custom LaTeX-to-SVG rendering engine.
- Built collaborative editing capabilities utilizing Operational Transformation and WebSockets.
- **Technologies**: JavaScript/TypeScript, WebSockets, Operational Transformation, LaTeX Rendering.

COVID-19 Severity Index — **Apr 2020 — June 2020**
Medical Solutions Developer — *Surabaya & Banda Aceh*

- Developed a clinical triage tool implementing a WHO-based scoring algorithm.
- Designed a secure, HIPAA-compliant data handling system.
- **Technologies**: Firebase, Algorithm Design, Secure Data Handling.

Mathematics Computer Science Educator — **Sep 2016 — Aug 2022**
Instructor Teacher — *Lhokseumawe & Banda Aceh*

- Served as a mathematics teacher and olympiad instructor for multiple institutions, including SMAN 1 Lhokseumawe, Sukma Bangsa Lhokseumawe, SMAN 2 Banda Aceh, and SMAK Methodist Banda Aceh.
- Trained students for competitive olympiad-level problem solving in mathematics and computer science.

EDUCATION

Bachelor of Mathematics, *Syiah Kuala University* — Aug 2020

PUBLICATION

Journal / Preprint / Thesis

- **Ridzi, M. A.** (2026). *Ridzi Butterfly Theory: A Symmetric Visualization & Topological Approach to the Goldbach Conjecture*. Preprint, DOI:10.5281/zenodo.18902529. Published via Zenodo (CERN Data Centre). — Mar 2026
  Introduces a mathematical visualization framework for the Goldbach Conjecture using a deterministic zero-gap packing algorithm. The work establishes a geometric equivalence for prime pair distribution and is accompanied by the *Goldbach Dream Project*, a Python-based implementation for large-scale statistical and topological data analysis.

- News Feature: AcehTrend – Peranan Pemrograman Komputer dalam Pelajaran Eksakta — Nov 2021

- **Ridzi, M. A.** (2020). *On the Arithmetic Properties of Ridzi's Inserted Numbers*. Preprint, DOI:10.5281/zenodo.18154164. Published via Zenodo (CERN Data Centre). — Aug 2020
  Investigates structural and arithmetic properties of digit-insertion integer classes (RIN), proving finiteness in fixed bases, non-existence in prime power bases for $r > 2$, and constructing maximal RIN in composite bases. Originally submitted as undergraduate thesis, Universitas Syiah Kuala.

- ICST: *The Numerical Solution by Modified Adomian Decomposition Method for General Wave Equation* — Jan 2020

- Conference Logika: *Algorithmic Development for Integral Computation in Primitive Integral Applications* — Nov 2017

Achievements

- National Mathematics Olympiad for University Students — 2019

- Winner – National Mathematical Modeling Competition — 2018