# KHALIEF ATTAR SANJAYA

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## SUMMARY

STEM researcher and full-stack engineer working across applied materials science, low-level systems, spatial computing, and web architecture. First-author ChemRxiv preprint contributor; twice selected as Indonesia's national champion delegation to defend applied engineering platforms at international summits in Singapore (ADVA Dengue Summit) and Seoul (KRAFTON Showcase). Chief Technology Officer at Matchindo and two-term computing lead at SMAN 107 Jakarta.

## EDUCATION

**SMAN 107 JAKARTA** Jakarta, Indonesia

***Senior High School Diploma in Natural Sciences (STEM Curriculum)*** Jun 2024 – Present (Exp: 2027)

- **Advanced Mathematics Coursework:** Algebra & Matrices, Trigonometry, Analytical Geometry, Probability & Statistics, and Introductory Calculus (Limits, Derivatives, Integrals).
- **Physics Coursework:** Classical Mechanics (Kinematics & Dynamics), Electricity & Magnetism (DC Circuits), Thermodynamics, Fluid Dynamics, and Mechanical Waves & Optics.
- **Academic Research & Leadership:** Authored empirical STEM laboratory reports; re-elected for two consecutive terms (2024–2026) as Chairperson of the student computing organization.

## HONORS & INTERNATIONAL AWARDS

**KRAFTON BETTER GROUND CHALLENGE 2025** Seoul, South Korea

***Best Game (1st Place) & Indonesian Country Representative*** Apr 2025 – Sep 2026

- Won Best Game (1st Place) nationally as Lead Programmer of Team Harn Studios out of 100+ secondary school engineering teams through multi-stage evaluations, including concept pitching, Godot technical prototype review, and a final live demonstration.
- Selected as the sole Indonesian student delegation to travel to Seoul, South Korea on a fully sponsored program to present **NeuroFall** at the Better Ground Challenge Showcase.
- Showcased the project at the international exhibition booth in Seoul, demonstrating gameplay systems and engaging in technical roundtables on simulation game design with KRAFTON engineers.

**ASIAN DENGUE VOICE AND ACTION (ADVA) — DENGUE SLAYER CHALLENGE 3.0** Singapore

***National Champion (1st Place) & ASEAN Grand Finalist*** Apr 2026 – Jun 2026

- Awarded 1st Place nationally as Lead Software Architect of Team Franky in the digital healthcare track for architecting **NIRA**, advancing as Indonesia's national finalist delegation to the ASEAN-level Grand Finals.
- Received full travel sponsorship to Singapore to compete at the 9th Asian Dengue Summit, presenting predictive geospatial surveillance models against finalist teams from Singapore, Malaysia, Thailand, and the Philippines.
- Defended platform telemetry directly before regional public health directors and tropical disease specialists, participating in healthcare technology masterclasses with international clinical researchers.

## PUBLICATIONS & PREPRINTS

**ATLAS: SELF-HEALING SULFUR COPOLYMER PAVEMENT** doi.org/10.26434/chemrxiv.15012077/v1

***First Author | ChemRxiv Preprint (K. A. Sanjaya, R. Amira, G. W. Utomo, R. N. Zaidan, M. Z. Ayman, R. Jonathan)*** Nov 2026

- Authored first-author study on circular sulfur polymer pavements, establishing TEOA-catalyzed inverse vulcanization at 80–120°C with complete suppression of toxic $H_2S/SO_2$ off-gassing.
- Validated SNI 03-0691 Class A and PN-EN 1338 compliance (41.8 MPa compressive strength, 0.16 wt% water absorption, >85% photothermal crack-repair recovery) with a 72.6% embodied carbon cut and 16.5%–30.4% cost savings vs. commercial *Mutu A* precast concrete.

## RESEARCH & APPLIED ENGINEERING PROJECTS

### DIGISANTARA: 3D EDUCATIONAL WEB GAME
digisantara.pages.dev

***Full-Stack Project Lead | 2nd Place Cohort Award (Team GAME-ART)*** Aug 2026 – Present

- Direct technical architecture of Digisantara (Digital Nusantara) as Project Lead for Indonesia's National P5 Curriculum (Theme: Digital Literacy), leading Team GAME-ART to develop an educational 3D/2D web game.
- Engineered an interactive 3D scene explorer using Three.js / WebGL coupled with HTML5/Canvas 2D mini-game platformer mechanics, implementing 4 structured digital ethics modules: anti-hoax verification, data security, anti-cyberbullying, and digital etiquette.
- Built client-side internationalization supporting 7 regional languages (Javanese, Sundanese, Batak, Banjar, Balinese, Indonesian, English); deployed production assets on Cloudflare Pages edge network.
- Awarded 2nd Place Best Project across the entire grade-level cohort at the SMAN 107 Jakarta P5 Exhibition, verified through live interactive trials with 200+ students and faculty evaluators.

### NIRA: PREDICTIVE DENGUE SURVEILLANCE PLATFORM
nirakita.com

***Lead Software Architect & Backend Engineer (Team Franky)*** Apr 2026 – Jun 2026

- Architected NIRA (Neighborhood Intelligence for Rapid Action) as Team Franky, bridging crowdsourced symptom telemetry with spatial epidemiology to detect vector outbreaks 7–14 days ahead of clinical reports.
- Formulated density-based geospatial clustering algorithms that aggregate crowdsourced symptom reports, precipitation telemetry, and municipal historical infection vectors to map disease transmission hotspots.
- Engineered a mobile-responsive web client with Leaflet.js / OpenStreetMap GIS integration, optimizing REST API payloads for sub-second report submissions across bandwidth-constrained 2G/3G mobile networks.
- Engineered spatial query indexing and client-side vector caching routines, sustaining sub-second epidemiological heatmap rendering across dense transmission clusters on low-bandwidth mobile devices.

### SEMAR: OFFLINE LMS SERVER VIA REPURPOSED HARDWARE
Jakarta, Indonesia

***Lead Hardware Architect & Systems Programmer*** Jan 2026 – Present

- Repurposed decommissioned Android Set-Top Boxes (Amlogic quad-core ARM Cortex-A53 SoCs) into low-cost headless Linux edge servers running Armbian OS for rural schools lacking stable internet and power.
- Authored a custom lightweight offline Learning Management System (SEMAR LMS) using a file-based storage engine, serving localized curriculum modules, video assets, and quizzes over an isolated local Wi-Fi network.
- Integrated an autonomous power management module combining a 3S Li-ion Battery Management System (BMS) with auto-cut off and an ESP32 microcontroller executing real-time ADC voltage/thermal telemetry and automated dual-fan active cooling.
- Benchmarked concurrent throughput supporting 15–30 simultaneous student connections over local Wi-Fi mesh with zero packet drop, reducing per-unit deployment costs by over 70% compared to commercial servers.

### NEUROFALL: PSYCHOLOGICAL SIMULATION GAME
harn-studio.itch.io/neurofall

***Lead Systems Programmer & Engine Architect (Team Harn Studios)*** Apr 2025 – Sep 2026

- Directed engine architecture of **NeuroFall** in Godot 4.4.1 with Team Harn Studios, creating an educational simulation exploring adolescent mental health and decision paralysis via a recursive temporal-loop narrative.
- Architected hierarchical finite state machines (HFSM) governing non-linear dialogue branching, custom UI control nodes, 2D lighting, and GLSL shaders responding in real time to player emotional states.
- Profiled GDScript execution cycles and draw calls to maintain 60 FPS performance across lower-spec hardware; directed version control (Git) and milestone workflows across scriptwriters, 2D artists, and audio designers.
- Won Best Game (1st Place) out of 100+ national teams at the KRAFTON Better Ground Challenge 2025; showcased live at the international exhibition in Seoul, South Korea.

## LICENSES & CERTIFICATIONS

- **EF SET English Certificate:** C1 Advanced (Score: 63/100, CEFR Proficiency) Jun 2026
- **British Airways (Forage):** Engineering Job Simulation (ID: 6afe6edf) Nov 2026
- **Leo Cussen Centre for Law (Forage):** Human Rights Law Simulation (ID: 6afe67b0) Nov 2026
- **edX Verified Certificate:** The Entrepreneurial Mindset (ID: 181f3021) Jun 2026
- **edX Verified Certificate:** Beginners Guide to Cybersecurity (ID: 574f7ecf) Jan 2026
- **edX Professional Certificate:** Problem Solving & Critical Thinking (ID: 864eaaaf) Jan 2026
- **Cursa:** Creative Writing Course (ID: 4c59618d) Dec 2025
- **Programming Hub:** Python & Fundamental Programming (ID: 17561723) Aug 2025

## CONFERENCE PRESENTATIONS & SYMPOSIA

**9TH ASIAN DENGUE SUMMIT (ADVA SUMMIT 2026)** Singapore

***Indonesian Finalist Delegate & Technical Presenter (Project NIRA)*** Jun 2026

- Delivered competitive oral presentation and live technical Q&A defense of Project NIRA for the Dengue Slayer Challenge 3.0 ASEAN Grand Finals before an international jury of regional health directors.
- Exhibited platform telemetry and GIS mapping at the official Indonesian delegation booth; demonstrated geospatial cluster prediction to medical researchers and attended healthcare technology masterclasses.

**BETTER GROUND CHALLENGE SHOWCASE (KRAFTON)** Seoul, South Korea

***Indonesian Innovation Delegate & Technical Exhibitor (NeuroFall)*** Sep 2026

- Demonstrated interactive live simulations of **NeuroFall** at the Better Ground Challenge Showcase exhibition booth in Seoul, presenting branching dialogue state machines, recursive mechanics, and simulation game architecture to visiting game developers and academics.
- Engaged in developer exchange roundtables with student finalist teams from South Korea, India, and Malaysia, holding bilateral technical feedback sessions with KRAFTON engineers on Godot engine optimization.

## LEADERSHIP & PROFESSIONAL EXPERIENCE

**MATCHINDO: B2B CROSS-BORDER TRADE PLATFORM** matchindo.com

***Chief Technology Officer (CTO)*** Sep 2026 – Present

- Direct full-stack technology roadmap, platform architecture, and operational web maintenance for an international B2B cross-border marketplace connecting global brands with Indonesian enterprises.
- Engineered PHP backend logic and relational MySQL database schemas with query indexing and caching routines; constructed responsive vanilla JS/CSS interfaces and managed Hostinger cloud DNS/SSL.

**FUN CODING EXTRACURRICULAR, SMAN 107 JAKARTA** Jakarta, Indonesia

***Two-Term Chairperson & Curriculum Director (Terms: 2024/2025 & 2025/2026)*** Jul 2024 – Present

- Re-elected by peers and faculty advisors to lead 35+ active student developers across two consecutive terms (2024/2025 and 2025/2026), directing weekly engineering lab sprints.
- Designed a 10-module engineering curriculum (Python, Embedded Systems, Linux, Web, Algorithms); organized hackathons and coached junior cohorts for national competitions.

**PRIMETIVE STUDIO (FORMERLY HARN STUDIOS)** Jakarta, Indonesia

***Founder & Lead Developer*** Jan 2025 – Present

- Founded Harn Studios (rebranded as Primetive Studio), directing software architecture, milestone delivery, and leading the team to win Best Game (1st Place) at the KRAFTON Better Ground Challenge 2025.

## COMMUNITY & VOLUNTEER SERVICE

**TED TRANSLATORS (TED CONFERENCES & TEDX)** Global Volunteer Network

***Volunteer Translator & Subtitler (English – Indonesian)*** 2025 – Present

- Accredited volunteer translator localizing global TED and TEDx talks from English into Indonesian to expand regional public access to STEM concepts.

## TECHNICAL & PROFESSIONAL SKILLS

- **Programming Languages:** Python, C/C++ (Embedded Systems / Arduino), GDScript (Godot 4.4.1), PHP, JavaScript, HTML5, CSS3, SQL, Bash.
- **Embedded & Hardware Systems:** Arduino, ARM SoCs (Amlogic/Rockchip), Battery Management Systems (BMS), I2C/UART/SPI Telemetry, Active Cooling.
- **Software, Tools & OS:** Headless Linux (Debian/Armbian), Three.js / WebGL, Leaflet.js, Godot Engine 4.4.1, Git/GitHub, Linux CLI, Cloudflare Pages, QGIS, Hostinger Cloud, VS Code, Typst/LaTeX, REST APIs.
- **Methodologies & Research:** Scientific Paper Writing, Concurrency Benchmarking, Hardware Stress Testing, Experimental Design, Technical Presentations.
- **Professional Skills:** Logical & Critical Thinking, Problem Decomposition, Cross-Functional Team Leadership, Project Management, Public Speaking.
- **Languages:** Indonesian (Native), English (Bilingual / C1 Fluency | TED Translator: English – Indonesian).