

# Raden Rafly Hanggaraksa Budiarto

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## Education

### Bandung Institute of Technology

Bachelor of Science in Computer Science, GPA: 3.62/4.0

August 2022 – October 2026

(Expected)

- #1 Engineering school in Indonesia
- Relevant Coursework: Operating Systems (AB), Artificial Intelligence (A), Web Development (A), Computer Architecture (B)

## Research Interests

- Distributed Systems – Scalability, fault tolerance, and high-performance computing.
- Operating Systems – Kernel development, process management, and low-level optimizations.
- Caching Mechanisms – Efficient data retrieval, memory hierarchy, and performance tuning.
- Machine Learning – Scalable training, distributed inference, and system optimization.

## Research Experience

### Remote Research Developer - IO Logger Project

Mar 2025

With Assistant Professor Juncheng Yang (joining Harvard University, Fall 2025)

- Designed and implemented eBPF-based IO tracing tools for UNIX systems that capture detailed disk operations, network transfers, and page cache activity
- Currently working on cross-platform implementations for Windows, MacOS, and Android to enable comprehensive personal computing environment tracing
- Developed infrastructure to collect and analyze IO traces from modern computing environments, including cloud, virtualized, and AI/ML workloads

### Systems and AI Research Training Program

Jan 2025

University of Chicago, Online

- Selected as one of the top 50 students in computer science and related fields for an international research training program led by Prof. Haryadi Gunawi.
- Analyzed 60+ papers from top CS conferences like OSDI, SOSP, and FAST, gaining insights into cutting-edge research.
- Replicating and reproducing up to six publications over the next months to validate findings and strengthen research skills.
- Received intensive training in research methodologies, technical writing, and engagement with top-tier research communities.

## Projects

### Simple Operating System [Project]

2024

- Developed a basic operating system kernel from scratch with support for interrupts, keyboard input, and FAT32 file system management, contributing 200+ LOC.
- Implemented key filesystem operations, including navigation (cd, ls), file management (mkdir, cp, mv, rm), and process control (ps, kill, exec).
- Designed a command-line interface with essential utilities like clear, help, find, and echo for user interaction.
- Tested and deployed the OS using QEMU, ensuring functionality across various operations.

### Arkavidia 9.0 Website [Website]

2025

- Annual IT competition organized by Informatics Student Association of ITB, engaging high school and college students through contests, workshops, and seminars.

- Co-led a team of **12 engineers** to develop the Arkavidia website, ensuring a seamless experience for **500+ users**, contributing **2000+ LOC**.
- Oversaw project planning and task delegation, maintaining alignment with deadlines and objectives.
- Conducted code reviews and mentored junior engineers, promoting best practices and technical growth.

#### Computer Vision Dashboard for MSL Autonomous Robot [Project]

2024

- Developed a dashboard to calibrate an autonomous robot based on its surroundings, contributing **900+ LOC**.
- Integrated **Nuxt** with the **Robot Operating System (ROS)** via Flask, enabling real-time data exchange.
- Enabled seamless communication and control between the Web interface and the robot sensors and actuators.
- Optimized system performance to ensure accurate and responsive robot calibration.

#### Honors & Awards

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##### Web Development Competition IFEST 2024 [Certificate] [Project]

2024

- Achieved **9th place** out of 39 teams (up to 4 people per team). Contributed over **2,000 LOC**.
- Developed an **organizational money manager** with **multi-role access control**.
- Implemented **AI-powered OCR** for automated receipt processing, enhancing financial tracking efficiency.

#### Organization

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##### Human Resource Lead - Robotics Club Regeneration Event (Sekolah URO ITB 17)

Aug 2024 – Jan 2025

- Led a team of **10 members**, coordinating divisions and assigning tasks to ensure smooth event execution.
- Managed **performance evaluations** and designed **team bonding activities** to improve collaboration.
- Created the **Standard Operating Procedure (SOP) for SEKURO 17**, structuring event workflows.
- Served as the **liaison between divisions**, ensuring seamless communication and integration.

##### Public Relations - College Robotics Club (Unit Robotika ITB)

Dec 2023 - Jan 2025

- Led PR initiatives, organizing events to promote the club's activities and increase public engagement.
- Managed external communications to foster collaboration with industry partners and other organizations.

#### Technologies

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**Programming Languages:** C, C++, Python, Go, Java, TypeScript, Kotlin, Haskell, C#, PHP

**Systems & Backend Development:** Linux, MySQL, PostgreSQL, SQLite, MariaDB, Drizzle ORM

**Operating Systems & Low-Level Development:** QEMU, Robot Operating System (ROS)

**AI/ML & Data Processing:** scikit-learn, Flask (for ML APIs)

**Infrastructure & DevOps:** Docker, Supabase, Neon, Vercel, CMake, Ansible