Muhammad Zaky Firdaus

Yogyakarta zaky@ucf.edu +6282136043010 muhammadzakyf muhammadzaky09

Education

University of Central Florida, USA *Incoming PhD Student* — *Aug 2026 – 2031 (expected)*
PhD in Computer Science

- Incoming Graduate Research Assistant under Prof. Hao Zheng's iCAT Lab

Gadjah Mada University *(Top #2 Research University in Indonesia)* — *Aug 2021 – Aug 2025*
BS in Computer Science

- Overall GPA: 3.85/4.0 —— Major GPA: 3.90
- **Undergraduate Thesis:** Reliability-aware Structural Pruning of Neural Networks
- **Relevant Coursework:** Computer Organization and Architecture, Digital Systems, Operating Systems, Deep Learning

University of Birmingham — *Sep 2023 – Dec 2023*
Exchange Program, Computer Science and Software Engineering

- Status: Pass
- **Coursework:** Neural Computation, Functional Programming using Haskell

Publications / Manuscripts

Understanding the Impact of Transient Hardware Failures on Quantized Neural Networks — *Apr 2025*
Authors: Gabriel Kaunang, **Muhammad Zaky F.**, Davin J. E. R., Santana Y. P., Muhammad Alfian A., Yanjing Li — *Manuscript will be available upon request*

Reliability-aware Structural Pruning of Neural Networks on Deep Learning Accelerators — *Oct 2025*
Authors: **Muhammad Zaky F.**, Muhammad Alfian A., Hiroyuki Takizawa
Status: In Preparation

Fully Homomorphic Encryption Inference of Neural Networks using CKKS–TFHE Scheme Switching and Accelerated Linear Layers — *Nov 2025*
Authors: Anas Banta S., **Muhammad Zaky F.**, Muhammad Alfi R., Muhammad Santriaji, Muhammad Alfian A., Reza Pulungan, Hiroyuki Takizawa
Status: Accepted in ASIA CCS 2026

Work and Research

Visiting Research Student — *Thuwal, KSA*
King Abdullah University of Science and Technology — *Oct 2025 – now*

- Working on Assassyn, an open-source unified framework for architectural simulation and RTL implementation, testing in-order RISC-V core with the Ramulator2 simulator and optimizing the build pipeline.
- **Microarchitectures:** Replaced FIFO-based instruction channels in Assassyn sim with a credit-counter flow-control, enabling multiple instructions in a single cycle and making backpressure explicit for the scheduler.
- **Compiler Optimization:** Engineered a context-aware build caching system for the Assassyn compiler front-end by tracking Intermediate Representation (IR) graphs to accelerate development cycles.

Undergraduate Research Collaborator — *Yogyakarta, ID*
Gadjah Mada University — *Sep 2024 – now*

- **Hardware Reliability:** Investigated the error resilience of compressed DNNs on NVIDIA's NVDLA and GP-GPUs for safety-critical systems; expanded and accelerated the FIdelity framework using CUDA to simulate transient faults and characterize the vulnerability of DL accelerators.
- **Privacy-Preserving NNs:** Conducted experimental validation for Precise ReLU support via CKKS-TFHE scheme switching; benchmarked optimized matrix multiplication and editorial support to the manuscript.

Research Engineer *Yogyakarta, ID*
Geoseismal Research Center *Jul 2025 – Nov 2025*

- Developed machine learning workflows for helping LRLC (Low resistivity, low contrast) hydrocarbon reservoir characterization in collaboration with PT Pertamina Hulu Rokan, upstream subsidiary of PT Pertamina.
- Processed and transformed 100+ GB of 3D seismic amplitude data from SEG-Y format to NumPy arrays, integrated well log petrophysical parameters for training Transformer-based seismic foundation models in reservoir property prediction.

Selected Technical Projects

Edge-AI Optimization on Embedded Systems (IoT) *2024*

- Deployed an integer quantized MobileNetV2 on a resource-constrained OrangePi 3B SBC; optimized inference latency for real-time performance.
- Implemented a Python Flask aggregation server on GCP Compute Engine to handle high-concurrency IoT telemetry data.
- **Stack:** Python, TensorFlow Lite, ONNX, Embedded Linux.

Scalable Recommendation Systems *2024*

- Architected Docker back-ends on Google Cloud Platform, achieving $\leq$ 100ms inference latency for a DL-based recommendation engine.
- **Stack:** Google Cloud Platform (GCP), Docker, Python.

Organization & Volunteering

UGM Google Developer Student Clubs - Developer *2023-2024*

- Participated in the 2024 Google Solution Challenge, creating a garbage classifier system for Indonesia's public spaces

Community Service - Publication Lead *2024*

- Participated in a 50-day volunteering service at a rural coastal region in Special Region of Yogyakarta, Indonesia, empowering local small and emerging industries, youth, and women's community
- Published three React-based promotional websites for small-medium "Batik" enterprises, deployed using Vercel service reaching up to 100 visitors in the first month

Technical Skills

Languages: C++, Rust, Python

Architecture & Simulation: Verilator, Ramulator2, Gem5 (Familiar), NVDLA, CUDA

ML & DevOps: PyTorch, Brevitas, Torch-Pruning, Docker, Google Cloud Platform (GCP)

Grants

KAUST Visiting Student Fellowship *2025*

- Awarded a competitive and funded research fellowship to conduct research at SyntheSys Lab at KAUST

Bangkit Academy Startup Incubation *2024*

- Received IDR 5,000,000 for the development of integrated mobile personalized sports planner and geographic-based sports social media

References

- **Asst. Prof. Jian Weng** (*Research Advisor*), King Abdullah University of Science and Technology, Saudi Arabia — `jian.weng@kaust.edu.sa`
- **Asst. Prof. Muhammad Alfian Amrizal** (*Research and Thesis Advisor*), Gadjah Mada University, Indonesia — `muhammad.alfian.amrizal@ugm.ac.id`
- **Prof. Hiroyuki Takizawa** (*Research Collaborator*), Cyberscience Center – Tohoku University, Japan `takizawa@tohoku.ac.jp`