Naufal Aditya Juniarahman

Electrical Engineer

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Electrical Engineer with a strong background in power electronics, embedded systems, and IoT-based solutions. Specialized in MMC control, HIL validation, and inverter design, with hands-on experience in MATLAB, Simulink, PLECS, and microcontroller programming. A fast learner and highly adaptable problem-solver, passionate about developing innovative solutions for renewable energy, automation, and industrial applications.

Education

Bachelor of Engineering, Electrical Engineering, Gadjah Mada University 2020 – 2025

- Specialization: Electronics and Power Electronics
- Thesis Title: Implementation of Three-Phase Inverter Control Using Hardware-in-the-Loop (HIL) Approach.
- Coursework: Power Electronics, Renewable Energy, Power System, Control and Instrumentation, Microcontroller.

Vocational School, Automation Engineering, SMK Negeri 1 Cimahi 2016 – 2020

- Awards : 2nd Place in LKS Electrical Installation (2018), 1st Place in PLC Competition – Maranatha (2018)
- Coursework: PLC Programming, Electrical Maintenance and Installation, Electro-Pneumatic Design.

Experience

Mechanical Intern, PT Lumbung Jaya International August 2019 – January 2020

- Performed precision drilling and cutting of iron components for fabrication, ensuring accurate measurements and adherence to safety standards.
- Assisted in electrical installation and repair projects for new buildings, including wiring, circuit setup, and troubleshooting, ensuring compliance with electrical safety regulations.

Engineering Intern, PT Polylamina Teknologi Indonesia February 2024 – April 2024

- Assisted in CAD and CAM processes, creating precise technical drawings and machine-ready designs for manufacturing.
- Improved manufacturing efficiency by streamlining cutting layouts, ensuring 100% adherence to design specifications.

Project

Modular-Multilevel Converter (MMC) Low-Level Control Design, UGM 2022

- Designed and tested capacitor balancing algorithms and SPI-based microcontroller communication, ensuring stable gate control for MOSFET switching in high-power applications.
- Developed and implemented low-level control algorithms for MMC, utilizing Nearest Level Control, Phase Disposition PWM, and Phase Shift PWM to enhance efficiency and performance in Solid-State Transformer (SST) applications.

Three-phase Inverter Design and Testing using HIL, UGM 2024

- Implemented and tested three-phase inverter control using Control HIL (C-HIL), Power HIL (P-HIL), and Combined Control & Power HIL (CP-HIL) methodologies in PLECS and Typhoon HIL, ensuring accurate real-time validation.
- Validated V/f control algorithm stability across varying frequency conditions, optimizing inverter performance for electric vehicles, renewable energy systems, and industrial automation.

IOT Project for Fire Detection and Air Quality, UGM 2023

- Developed an IoT-based smart home safety system integrating MQ2, DHT, ZMCT103C, and GP2Y1014AU0F sensors with an ESP32 microcontroller to detect fire hazards and monitor air quality in real time.
- Implemented automatic fire prevention mechanisms, including electrical current cutoff via relay control, and designed a cloud-based monitoring system for remote access to air quality and fire alerts.

Additional Information

Hard Skill:

- Programming & Embedded Systems: Python, C, MATLAB, ESP32, Arduino, TI.
- Electrical Simulation & Testing: MATLAB, Simulink, PLECS, Typhoon HIL.
- Circuit & PCB Design: QSpice, LTSpice, KiCAD, Eagle.

Languages :

- Indonesia (Native)
- English (TOEFL 540, TOEIC 690)

Certification and Training :

- PLECS Training – UGM (2022)
- Digital Marketing - Kemnaker Training Course (2020)
- Medium Network Construction and Installation Technician - ESDM Certificate (2020)
- Signal Processing - Open University Course (2025)