Figo Arzaki Maulana

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Professional Summary

Electrical Engineering Student specializing in embedded systems, robotics, and hardware design. Proven ability to lead high-performance teams, demonstrated by securing 1st place at the KRI 2024 National Robotics Competition. Experienced in full-stack hardware development, from custom 6-layer PCB design, IoT devices development to advanced robotics control systems, bridging low-level firmware and high-level applications. Eager to apply strong problem-solving and advanced technical skills to challenging engineering problems.

Skills and Technologies

Programming: C, C++, Python, Matlab, Ladder Logic, Verilog, JavaScript, PHP, Dart
Embedded Systems: STM32, ESP32/8266, RP2040, AVR, PIC, 8051, FPGA
Development Platforms: Linux, ROS, ESP-IDF, Pico SDK, FreeRTOS, Flutter
Protocols: CAN, SPI, I2C, UART, USB, I2S, SDIO, Modbus, Ethernet, WiFi, HTTP/HTTPS
Simulation & Analysis: MuJoCo, LTspice, Proteus, Simulink, pyBullet, NI Multisim
Design & Dev Tools: KiCad, Autodesk Eagle, Fusion 360, STM32CubeIDE, VSCode, PlatformIO, TensorFlow, Git
Languages: English (TEFL 573), Japanese (N4 Equivalent)

Experience

ITS Microelectronics and Embedded System Lab Assistant Dec 2024 – Present

- Mentored students in practical applications of electronic theory, guiding them through experiments and troubleshooting techniques.

Head of Electronics Division, Abinara-1 Robotics Team Dec 2022 – Present

- Led the end-to-end hardware and software development of the Phynix-1 Hexapod Robot, culminating in a 1st place victory and Best Strategy award at the KRI 2024 National competition.
- Successfully implemented Agile methodologies to enhance team collaboration, enabling iterative development and significantly accelerating project timelines.
- Lead engineered and validated complex, high-speed PCBs up to 6 layers, including a carrier board for the NVIDIA Jetson platform, ensuring optimal signal integrity and system reliability.

Hardware and Embedded System Engineer, PT. Terobosan Anak Bangsa - Tulibot Apr 2023 – Jun 2024

- Led the development of a wireless transcription device that can transcribe upto 3 person in real time, and creating a companion Flutter app.

IoT Developer and Hardware Engineer, Lokapin Sep 2022 – Mar 2023

- Led the entire hardware development lifecycle for a LoRa-based pet tracker, from component research and BOM creation to the final 4-layer RF PCB design and firmware implementation, optimizing for low power consumption.

Electrical Technician Internship, Autonik Pack Machinery Oct 2021 – Mar 2022

- Executed industrial machine assembly, electrical wiring, and precision configuration of VFDs and thermal controllers for packaging machinery.
- Ensured all installations met project specifications and quality standards.

Projects

Fiammetta Cheetah Robot (Abinara-1 Team Project)

- Architected and single-handedly developed the entire C++ control framework, integrating trajectory planning, state estimation, and advanced control methods to achieve dynamic movement.
- Implemented a sophisticated control stack featuring Model Predictive Control (MPC) for intelligent footstep planning and Whole-body Impulse Control (WBC) for precise, torque-based command execution. The resulting implementation is robust enough to withstand significant external disturbances, such as being kicked.
- Engineered both the low-level MCU firmware for sensor/actuator communication and the high-level PC-side software stack, establishing a seamless, real-time link for control and telemetry.
- Currently formulating and developing a novel, lightweight vision stack for real-time obstacle avoidance. This system is designed to provide collision avoidance for both the robot's body and individual feet while traversing complex terrain.

Phynix-1 Hexapod Robot (Abinara-1 Team Project)

- Architected the foundational software and hardware, developing the core kinematics engine and motion planning algorithms while also leading the complete electronics system design.
- Led the hardware architecture design for a custom 6-layer carrier board for an NVIDIA Jetson, featuring an STM32H7 co-processor, a complex PMU with USB-C PD, and numerous high-speed interfaces including USB 3.0 and PCIe.

BGA Rework Station Temperature Controller

- Designed and implemented a modern, intuitive embedded user interface using LVGL, significantly enhancing usability and workflow for user operations.
- Developed a high-precision temperature control system for BGA rework, architected around an RP2040 microcontroller and a MAX6675 thermocouple interface.
- Authored custom, low-level C/C++ drivers for all system peripherals, implementing memory and thread-safe operations within a FreeRTOS environment to guarantee reliability.

4-DOF Robotic Arm

- Engineered and fabricated a 4-DOF robotic arm, managing the entire process from 3D modeling and PLA-based 3D printing to final hardware assembly.
- Developed a responsive motion system using a standard PS2 controller for manual operation.

Achievements

- **1st Place & Best Strategy**, Kontes Robot Indonesia 2024 (National)
- **3rd Place**, Kontes Robot Indonesia 2024 (Regional)
- **1st Place**, Arduino Programming Competition, MECHAFEST 2021 (National)
- **3rd Place**, Microcontroller Programming Competition, INFEST 2022 (National)
- **3rd Place**, Instrumentation Paper Competition, INFEST 2021 (National)

Education

Sepuluh Nopember Institute of Technology (ITS)　　　　　　　　　　　　　　　Expected 2026

Bachelor's Degree in Electrical Engineering
GPA: 3.67/4.00

SMKN 1 Kediri　　　　　　　　　　　　　　　　　　　　　　　　　　　　　Graduated 2022

Industrial Automation Engineering