

# ALRIDHO

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## EDUCATION

### Hasanuddin University

*Physics, Electronics and Instrumentation. GPA: 3.89*

Makassar, Indonesia

Aug 2021 – Oct 2025

- Participant in the 4th International Medical Device and Technology Conference (iMEDiTEC 2025) in Penang, Malaysia.
- Committee Member and Participant in the National Physics Seminar (SNF) 2024 Makassar.
- Teaching Assistant for Machine Learning and Introduction to Linux courses.

## EXPERIENCE

### Laboratory Assistant - Instrumentation Lab

*Hasanuddin University*

July 2024 – June 2025

Makassar, Indonesia

- Instructed the Microcontroller Systems practicum, teaching sensor integration on Arduino/ESP32 using  $I^2C$  and  $SPI$  protocols.
- Guided the IoT Instrumentation practicum, focusing on device connectivity via HTTP REST API, WebSocket, and Blynk for data monitoring.

### Independent Study - Machine Learning

*Bangkit Academy led by Google, GoTo, Tokopedia, and Traveloka*

Feb 2024 – June 2024

Makassar, Indonesia

- Mastered machine learning and deep learning concepts, ranging from mathematical foundations to algorithm development with TensorFlow and cloud deployment.
- Collaborated with a team to develop an Android application integrated with machine learning models.
- Graduated with best graduate distinction.

## RESEARCH EXPERIENCE & PUBLICATIONS

### Research Assistant - Machine Learning

*Collaborative Fundamental Research (PFK) Unhas 2024*

- Contributed to the development of an IoMT framework for Real-Time Patient Consciousness Monitoring by processing muscle signal (EMG) and heart rate (ECG) data.
- Built an Unsupervised Learning pipeline for physiological time-series data using TS2Vec for feature embedding and DBSCAN for data clustering.
- Co-authored an international scientific publication in the Signals journal (MDPI): [doi.org/10.3390/signals6040067](https://doi.org/10.3390/signals6040067).

### Research Assistant - Machine Learning

*PPS-PTM BIMA DIKTI Grant*

- Designed an IoT and Machine Learning-based health monitoring system for hypertension patients to enable early detection of stroke risk.
- Developed Random Forest, Logistic Regression, and XGBoost models using SMOTE techniques to optimize imbalanced data on a custom dataset, achieving  $\approx 90\%$  accuracy on test data. Manuscript is currently under review.

### Research Assistant - Internet of Things

*Community Service Program (PPMU) Unhas 2025*

- Designed and implemented a Smart Irrigation and hydroponic automation system based on ESP32, integrated with the Blynk platform for remote monitoring.
- Deployed the device at the partner location and provided a system demonstration to the To Nepo Farmer Group in Barru Regency.

## PROJECTS

### Robotic Arm Defect Sorter Based on VAE & YOLO

- Developed a Convolutional Variational Autoencoder (C-VAE) model for anomaly detection, trained exclusively on normal datasets to recognize defects using MSE between input and reconstructed images.
- Integrated the YOLO algorithm as a pre-processing step to detect objects and crop bounding boxes before inputting them into the VAE model.
- Connected both models with a robotic arm system for automatic sorting. The integrated robot and deep learning system achieved 100% accuracy on 20 mixed test containers (normal and defective).

### Sentiment Analysis - IndoBERT Fine Tune

- Built a custom dataset from Google Maps reviews and applied stopword removal using the Sastrawi library.
- Performed fine-tuning on the pre-trained IndoBERT model using the processed data.
- Developed a REST API for the model using FastAPI with comprehensive documentation.

## TECHNICAL SKILLS

**Languages:** Python, C/C++, SQL (Postgres), Go, JavaScript

**Frameworks & Libraries:** PyTorch, TensorFlow, Keras, Scikit-Learn, OpenCV, Hugging Face, Pandas, NumPy, Matplotlib

**MLOps & Tools:** Git, Docker, Linux, AWS EC2, FastAPI, Vercel