ALRIDHO

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Education

Hasanuddin University Makassar, Indonesia
Physics, Electronics and Instrumentation. GPA: 3.89 *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 July 2024 – June 2025
Hasanuddin University *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 Feb 2024 – June 2024
Bangkit Academy led by Google, GoTo, Tokopedia, and Traveloka *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.
- Authored an international scientific publication in the Signals journal (MDPI): 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 ≈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