

Ade Rizky Darmawan

IT & Artificial Intelligence Enthusiast | Certified IT Specialist

aderizkydarmawan123@gmail.com aderizkydarmawan.me
linkedin.com/in/aderizkydarmawan Surabaya, East Java, Indonesia

SUMMARY

A young tech enthusiast passionate about **information technology and artificial intelligence**, currently pursuing a Bachelor of Data Science at UPN "Veteran" Jawa Timur and certified as an **IT Specialist – Computational Thinking** (Certiport, Pearson VUE). Approaches problems systematically through data, programming, and machine learning/deep learning, from research and data analysis to building ready-to-use AI applications. Eager to learn new technologies, collaborate in cross-disciplinary teams, and turn ideas into useful digital solutions.

EDUCATION

UPN "Veteran" Jawa Timur 2023 – Present
Bachelor of Data Science *Surabaya*

WORK EXPERIENCE

Research Assistant (Research Internship) – Data Science & Applied ML Jan 2026 – Present
UPN "Veteran" Jawa Timur, Faculty of Computer Science *Surabaya*

- Designed and estimated a **GARCH-MIDAS** model of Jakarta Composite Index (IHSG) volatility using seven macro-financial variables (BI Rate, inflation, M2, real GDP, FFR, VIX, USD/IDR) over 2016Q2–2026Q1.
- Ran likelihood ratio tests against a GARCH(1,1)-t benchmark, plus robustness checks across alternative MIDAS lag structures and pre-/post-COVID-19 subsamples.
- Prepared the manuscript as **first and corresponding author**, from problem formulation to final editing.
- Contributed to benchmarking **12 lightweight CNN architectures** for oil palm leaf disease classification (two-phase transfer learning, 5 repeated stratified splits, 546 images).
- Profiled model efficiency (parameters, size, MACs, GPU/CPU latency) and performed Grad-CAM interpretability analysis.
- Collaborated with researchers from UMPSA and INTI International University, Malaysia.

Tools: Python, statsmodels, scikit-learn, PyTorch, pandas, NumPy, Matplotlib, LaTeX.

Data Analyst Intern (Environmental Data Analysis) Aug 2025 – Dec 2025
Surabaya City Environmental Agency (DLH Kota Surabaya) *Surabaya*

- **Capstone:** comparative study of daily PM2.5 forecasting (Kebonsari AQMS, 2024) with temperature, humidity, and wind speed as exogenous variables; **SARIMAX** performed best (MAPE 6.53%) vs. LSTM (29.41%) and Naive (11.78%), confirmed by the Diebold-Mariano test (DM $= -4.30$, $p < 0.05$), and was used for a 14-day forecast with 95% confidence intervals.
- Performed EDA on water and air quality data to identify patterns and anomalies.
- Built a multiparameter water quality prediction model using machine learning.
- Segmented Air Pollution Standard Index (ISPU) data with **K-Means Clustering** and developed an air quality classification model to support decision-making.
- Verified environmental quality standard calculations in Microsoft Excel and supported technical report preparation.
- Took part in water, air, soil, seawater, and sediment sampling; created educational content for World Environment Day.

Tools: Python (pandas, statsmodels, scikit-learn, LSTM), Google Earth Engine, Microsoft Excel, Matplotlib/Seaborn.

PROJECTS

Marine Oil Spill Detection & Mapping from Sentinel-1 SAR Imagery (Edge AI) Sep 2026
Team Lead & Model Architect – Deep Learning Capstone (Team CAYMAN, 6 members)

- Designed a **U-Net Lite** (1.94M parameters) for oil spill segmentation on 4,193 Sentinel-1 images, achieving **Dice 0.855** / IoU 0.746 on the test set, well above the dark-spot baseline (Dice 0.726).
- Compared 5 ML vs. DL models (Random Forest, LightGBM, U-Net Lite, DeepLabV3+ MobileNetV2); DeepLabV3+ performed best with Dice 0.867 and the strongest cross-sensor (PALSAR) generalization.
- Quantized the model to **ONNX INT8 (2 MB, 3.9× smaller)** with negligible accuracy loss and deployed fully in-browser inference (onnxruntime-web) at ∼100–300 ms latency.
- The web app includes slick polygon extraction (GeoJSON), oil spread simulation, and an HSSE cost & risk calculator.

Tools: PyTorch, scikit-learn, LightGBM, ONNX Runtime, Google Colab (T4), JavaScript, Vercel. Demo: cayman-kelompok1.vercel.app

Digital Mangrove Monitoring: Spatial Cross-Validation & Data Quality Audit
Research Team Member (with Amri Muhaimin, Alfan Rizaldy Pratama, et al.) – Faculty Research, UPN "Veteran" Jawa Timur

- Co-authored a journal manuscript (JUTIF) on machine learning mangrove classification from open Landsat imagery.

- Audited 904 image patches down to 362 usable ones, extracted 23 features (band statistics, NDVI, NDWI, MNDWI), and compared Random Forest, XGBoost, and SVM.
- Quantified random-CV optimism: balanced accuracy dropped noticeably under **spatial block CV**, and nested spatial tuning recovered it (McNemar, Friedman, Cochran's Q tests).
- Built a **Streamlit GUI** prototype for prediction, training, evaluation, and model comparison, with a user manual; supported a proposal for a coastal mangrove monitoring system (drone, Sentinel-1/2, GIS).

Tools: Python, scikit-learn, XGBoost, rasterio/GeoTIFF, Streamlit, Google Earth Engine.

Domestic Monetary Policy & Global Risk Factors as Drivers of Indonesian Stock Market Volatility (GARCH-MIDAS)
First & Corresponding Author – submitted to Risks (MDPI), June 2026

- Combined weekly IHSG returns with monthly/quarterly macro variables (BI Rate, inflation, M2, real GDP, FFR, VIX, USD/IDR) over 2016Q2–2026Q1.
- GARCH-MIDAS significantly outperformed GARCH(1,1)-t (**LR = 112.78** domestic and 108.73 global, $p < 0.001$).
- Identified **inflation** as the only robust driver of long-run volatility (consistently negative across MIDAS lag $K = 12$ and pre-/post-COVID-19 subsamples).

Exploring Lightweight CNN Architectures for Oil Palm Leaf Disease Detection with Interpretability Analysis
Third author – manuscript for IJEER, collaboration of UPN "Veteran" Jatim, UMPSA, and INTI International University

- Benchmarked 12 lightweight CNNs under one protocol: two-phase transfer learning, 5 repeated stratified splits (546 images), 6 metrics, GPU/CPU latency profiling, and Grad-CAM with 3 annotation-free attention metrics.
- The top three architectures were statistically tied (McNemar test), so the recommendation weighed size, latency, and Grad-CAM attention rather than accuracy alone.
- Showed the risk of single-axis selection: the smallest model missed many diseased leaves, and efficiency rankings reordered between GPU and CPU.

Vegetation Monitoring Web App on Google Earth Engine
Interactive GEE app for monitoring vegetation from Landsat 8 Collection 2 imagery (2020–2025): selectable vegetation indices (NDVI, etc.), density zoning with an adjustable threshold, vegetation density and condition model layers, false color (NIR) composite, and click-to-inspect pixel values. Demo: bledos.projects.earthengine.app/view/monitoring-vegetasi-testing
Tools: Google Earth Engine (JavaScript API), Landsat 8 Collection 2.

CERTIFICATIONS

IT Specialist – Computational Thinking May 2026 – May 2031
Certiport – A Pearson VUE Business *ID: 4nA8-XMzy*

SKILLS

Programming	Python (pandas, NumPy, SciPy, statsmodels, scikit-learn, PyTorch, pingouin), Git, Jupyter, VS Code, Google Colab, LaTeX
Statistics & Econometrics	Descriptive & inferential statistics, hypothesis testing, regression, multivariate analysis, time series, GARCH/MIDAS
Machine Learning	Supervised (regression, classification), unsupervised (clustering, PCA), deep learning (CNN, transfer learning, Grad-CAM)
Data Visualization	Matplotlib, Seaborn, Plotly, Tableau, Excel dashboards
Spatial Analysis	Google Earth Engine, multispectral satellite imagery, spectral indices, land cover classification
Finance	Macroeconomics, capital market theory, exchange rates & asset movements, on-chain analytics
Productivity	Microsoft Office (Word, advanced Excel, PowerPoint), AI tools (ChatGPT, Claude, Gemini, DeepSeek)
Soft Skills	Cross-disciplinary teamwork, critical thinking, scientific writing, presentation, time management

ORGANIZATIONS & COMMITTEES

2024	Committee Member, Data Science Student Orientation, UPN "Veteran" Jawa Timur, Pacet
2023	Participant, Data Science Student Orientation, UPN "Veteran" Jawa Timur (Surabaya & Pacet)
2023	Member, Veteran Esports Club, UPN "Veteran" Jawa Timur