

# Irfan Mas'udi

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## SUMMARY

AI/ML Engineer with 5+ years bridging research and production. Currently at Samsung Research Indonesia, contributing to recommendation systems, LLM-based agentic workflows, and generative AI for consumer devices. Known for translating complex research ideation into production-ready solutions. Seeking senior AI/ML engineering roles in product-driven, research-forward environments.

## PROFESSIONAL EXPERIENCE

**Samsung Research Indonesia**, Jakarta, Indonesia Feb 2024 – Present

R&D Institute of Samsung Electronics Co., Ltd

*AI/ML Engineer*

- Designed, optimized, and deployed large-scale recommendation systems for Samsung Galaxy Store (Apps, Games, Themes, Wallpapers); applied content-based and collaborative filtering leveraging multi-modal representation learning to generate top-K personalized recommendations, achieving ~90% reduction in inference latency and improving diversity and coverage metrics.
- Led a team of 5 engineers to research LLM-based agentic AI workflows – including Retrieval-Augmented Generation (RAG), prompt engineering, structured outputs, function calling, and tool integration – for Samsung Vision AI Companion feature.
- Led a team of 3 to research deep generative models for image and 3D applications, enabling immersive AI features on Samsung devices.
- Built and scaled end-to-end MLOps pipelines – data ingestion, feature engineering, model training, evaluation, CI/CD, and deployment – across cloud and on-device environments.
- Contributed to multiple AI patents and peer-reviewed publications; awarded Employee of the Quarter Q2 2025.
- **Tech:** Python, PyTorch, TensorFlow, Databricks, AWS, Apache Spark, SQL, MLflow, Docker, FAISS, Vector Database, LlamaIndex, Pandas, Polars, Git.

**EEPIS Robotics Research Center**, Surabaya, Indonesia Sep 2018 – Nov 2019

University research center for robotics technology and development

*Research Assistant*

- Proposed and implemented a hybrid PID-fuzzy logic control architecture for ROV motion control, improving maneuverability and stability by 21.9% vs. a conventional PID baseline.
- Applied YOLOv3 to build an underwater object classification pipeline achieving 89.6% detection accuracy; led full cycle from dataset collection and annotation to model training and evaluation.
- First-authored and co-authored multiple research papers published in international conferences and journals.
- **Tech:** Python, TensorFlow, ROS, OpenCV, Git.

**Advanced Robotics Technology**, Surabaya, Indonesia Mar 2017 – Sep 2018

Pre-seed technology startup specializing in educational robotics manufacturing

*Software Engineer*

- Led software engineering for educational robotics products, directing 4 engineers across embedded systems (C/C++) and Android application development.
- Co-led fundraising efforts securing IDR 120M in pre-seed investment; built data-driven tools for production optimization including inventory tracking and sales analytics.
- **Tech:** C, C++, Java (Android), Excel.

## TECHNICAL SKILLS

- **Languages:** Python, SQL, C, C++, Java
- **ML/DL Frameworks:** PyTorch, TensorFlow, Scikit-Learn, HuggingFace, LlamaIndex
- **Generative AI & LLM:** Diffusion models, GANs, LLM fine-tuning, RAG, prompt engineering, agentic workflows, structured outputs, function calling, MCP, and Context Engineering.
- **Recommender Systems:** Collaborative filtering, content-based filtering, matrix factorization (SVD, ALS, BPR), two-tower models, LightGCN, FAISS, vector search (Milvus)
- **MLOps & Infrastructure:** MLflow, Docker, AWS, Databricks, Apache Spark, Apache Kafka, CI/CD, Git
- **Data Engineering:** Pandas, Polars, ETL pipelines, NoSQL (MongoDB, Redis, Cassandra), PostgreSQL, MySQL
- **Other:** A/B testing, time series analysis (ARIMA), reinforcement learning, computer vision (OpenCV, YOLO, U-Net)

- SELECTED PROJECTS [\[DETAILS\]](#)
- **LLM from Scratch:** Implemented BPE tokenizer, Transformer decoder architecture, and autoregressive pretraining pipeline end-to-end in PyTorch.
  - **Vision Transformer from Scratch:** Implemented ViT architecture and training pipeline from scratch in PyTorch for image classification.
  - **Semantic Segmentation:** Built U-Net for urban scene understanding; achieved 88.5% test accuracy and 0.40 mean IoU.
  - **GAN for Image Generation:** Implemented Generator and Discriminator from scratch for MNIST image synthesis.
  - **Human Activity Recognition:** Benchmarked LSTM, BiLSTM, and 1D-CNN on multivariate time series; best F1 of 0.630 with 1D-CNN.
  - **Multivariate Time Series Forecasting:** Two-layer BiLSTM on 7-feature sequential dataset; RMSE of 4.03.
  - **Clustering Benchmarking:** Compared LDA, QDA, KNN, and SVM; best F1 0.800 with SVM. K-Means clustering with PCA on MNIST achieving 0.790 purity.

EDUCATION

**Politecnico di Milano**, Milano, Italy Feb 2020 – Dec 2023  
MSc in Computer Science and Engineering GPA: 3.45/4.0 (86/110)

*Key coursework:* Machine Learning, Deep Learning & ANNs, Recommender Systems, Unstructured and Streaming Data Engineering, Advanced Databases, Operation Research, Time Series Analysis, Reinforcement Learning.  
*Thesis:* DILLEMA: Metamorphic Testing for Deep Learning using Diffusion and Large Language Models.

**Politeknik Elektronika Negeri Surabaya**, Surabaya, Indonesia Jun 2014 – Aug 2018  
BSc in Computer Engineering GPA: 3.67/4.0

*Key coursework:* Programming, Algorithm and Data Structure, Object-Oriented Programming, Computer Vision.

SELECTED PUBLICATIONS [\[SCHOLAR\]](#)

**DILLEMA: Diffusion and Large Language Models for Multi-Modal Augmentation**  
L Baresi, DYX Hu, MI Mas'udi, G Quattrocchi  
*IEEE/ACM International Workshop on Deep Learning for Testing (DeepTest)*, 2025

**EROV: Depth and Balance Control for ROV Motion Using Fuzzy PID Method**  
EH Binugroho, W Ab, MI Mas'udi et al.  
*International Electronics Symposium (IES)*, 2019

**Fusion of Feedforward and Feedback Control Using Fuzzy for Active Handling and Dribbling in MSL Robot Soccer**  
MI Mas'udi, F Ardilla, IK Wibowo  
*International Electronics Symposium on Engineering Technology and Applications (IES-ETA)*, 2018

AWARDS & RECOGNITION

- Employee of the Quarter, Samsung Research Indonesia 2025
- Invited guest lecturer on AI/ML topics at universities Ongoing
- LPDP Scholarship (Indonesian Government fully-funded Master's scholarship) 2019
- Runner-up, Most Outstanding Student of the Republic of Indonesia 2017
- 2nd Runner-up & NOK Award, Asia-Pacific Broadcasting Union (ABU) ROBOCON 2016
- Winner, Indonesia National Robot Contest 2016