

Marthan Lanuzga

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Experience

DOST – Advance Science and Technology Institute Software Engineering Intern

Quezon City, PH
May 2025 – August 2025

- **Optimized ML pipelines** for large-scale computer vision projects, reducing manual feature extraction by **60%** while ensuring **100% compliance** with ISO-compliant government thresholds.
- Developed React front-end interfaces with underlying machine learning models alongside a **9-member Agile team**, enabling real-time data visualization.
- **Refactored machine learning pipeline** configurations to replace hardcoded parameter sets with dynamic, validated, and standard operational thresholds to guarantee strict data integrity.

Sasquatch Lead Software Developer

Caloocan City, PH
September 2025 – Present

- Architected a behavior-aware AI assistant using deterministic static analysis and a tiered LLM escalation layer that **eliminated 95%** of common syntax and type errors during the development phase via local deterministic analysis, maintaining a **sub-50ms execution overhead**.
- Designed a **deterministic-first architecture** with clear separation between local analysis and a future AI escalation layer.

Projects

Pathfinder | Autonomous Tourism Agent Full-Stack AI Engineer

September 2025 – June 2026

- Created a **greedy heuristic algorithm** to approximate the **Traveling Salesperson Problem (TSP)** on edge devices, clustering destinations geographically while adhering to **O(n) complexity constraints**.
- Reduced RAG pipeline latency by **90% (~300ms)** by architecting a semantic caching layer on ChromaDB, eliminating redundant vector computations and cutting LLM operational costs by **~80%**.
- Designed an offline distributed architecture deployed on Raspberry Pi hardware, achieving **90% system availability** and enabling query processing in **zero-connectivity environments**.

Med-ID | AI Drug Label Analyzer AI/ML Developer

September 2025 – October 2025

- **Developed a CNN in TensorFlow/Keras** to classify drug names and dosages from raw pill bottle images, serving as the core classification layer for downstream OCR and NER processing.
- Trained a custom **NER model** using **spaCy** to extract pharmacological entities, cross-referencing outputs against the **OpenFDA API** to ensure **100% data compliance**.
- Architected a **hybrid computer vision pipeline** using **OpenCV** for adaptive image thresholding and **PaddleOCR** for text extraction on high-noise medical imagery.

AKMA | Autonomous Knowledge Architecture AI Systems Developer

May 2026 – June 2026

- Engineered adversarial **multi-stage validation logic**, including a Lazy Delta layer, achieving a **100% rejection rate** against poisoned or unverified web claims.
- Designed a multi-agent Retrieval-Augmented Generation (**RAG**) pipeline using Python and LLM APIs to **autonomously expand knowledge bases** without manual curation.
- Authored the technical manuscript, *AKMA: Autonomous Knowledge Mutation for Persistent RAG Systems*, currently under review at IEEE Transactions on Knowledge and Data Engineering.

PokeBind | E-Commerce Platform
Full-Stack Developer

March 2026 – Present

- Architected an **e-commerce storefront** using **Next.js & Supabase** for real-time inventory management, authentication, and image storage.
- Integrated the **PayMongo API** to handle **secure local payment processing**, including **GCash and Maya** support via specialized webhook listeners.
- Developed responsive UI using **Tailwind CSS**, implementing server-side logic for order validation and **automated stock restocking** via Next.js API routes.

Education

Catanduanes State University

Catanduanes, PH

BS Computer Engineering

2022 – 2026

- **Relevant Coursework:** Computer Networks & TCP/IP, Data Structures & Algorithms, Object-Oriented Programming, Machine Learning, Edge AI, Embedded Systems, Digital Signal Processing
- 1st Place Winner (Team Leader) – 2026 Regional ICpEP Robothon Challenge.
- Regional Representative — 2023 Regional ICpEP Robothon Challenge.

Cielito Zamora Senior High School

Metro Manila, PH

STEM

2020 - 2022

- Graduated at the top of a competitive cohort of **200+ students**, maintaining a consistent general weighted average of **95%**.
- Programmed **autonomous line-following algorithms** in **MicroPython** for custom-built robotics systems participating at **FIRST LEGO League**.
- Participated in the in the **regional-level mathematical sci-dama competition** with a **2rd-place finish**.

Technical Skills

Languages: Python, TypeScript, C++, JavaScript, SQL, HTML/CSS.

Web Development: Next.js, React, Vue, FastAPI, Supabase, Tailwind CSS.

AI & Data Science: PyTorch, TensorFlow, Keras, RAG, OpenCV, Pandas, NumPy, Scikit-Learn.

Tools & Databases: Docker, Git, PostgreSQL, ChromaDB, FAISS, MySQL, SQLite, DBEaver.