Allan Emmanuel B. UMALI, ECE, ECT

Applied AI & Computer Vision · Open to graduate research opportunities in Japan

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RESEARCH INTERESTS

Computer vision for real-world systems: self-auditing traffic analytics, retail behavior sensing, and edge deployment. I also work on reliable LLM agents, which means evaluation design, guardrails, human-in-the-loop workflows, and cost-aware model routing, along with data-efficient annotation, synthetic data, and MLOps reproducibility.

PUBLICATIONS

1. **Umali, A.E.B.**, et al. "GATE: Graph-Admissible Transition Evaluation for Self-Auditing Turning-Movement Counting from Monocular Traffic Cameras," in *2026 IEEE International Conference on Future Machine Learning and Data Science (FMLDS)*, Kobe, Japan, Nov 2026. Accepted, to appear in the proceedings. **First author and presenter.**
2. Jose, J.A.C.; Bertumen, C.J.B.; Roque, M.T.C.; **Umali, A.E.B.**; Villanueva, J.C.T.; TanAi, R.J.; Sybingco, E.; San Juan, J.; Gonzales, E.C. "Smart Shelf System for Customer Behavior Tracking in Supermarkets," *Sensors* (MDPI), 24(2), 367, 2024. doi:10.3390/s24020367. Contributed the weight-sensor system, the off-the-shelf vision system, and customer-product association in the integration system.

EDUCATION

De La Salle University — Manila, Philippines
M.Sc. in Data Science (in progress; coursework partway complete) — *Sep 2025 – Present*

- Advanced machine learning, statistical modeling, and big-data analytics.

De La Salle University — Manila, Philippines
B.Sc. Electronics and Communications Engineering, minor in Applications Development — *Sep 2019 – Dec 2023*

- Thesis: "Smart Shelf System for Customer Behavior Tracking in Supermarkets." Gold Undergraduate Thesis Nominee; the work was later published in *Sensors* (2024).
- Licensed ECE and ECT (October 2024), general average 85.70%, among the top ratings of DLSU takers.
- Jose Rizal Honors; Dean's Lister six times; Philippine National Champion, IECEP Interscholastic Quiz Show 2022.

RESEARCH EXPERIENCE

De La Salle University, Intelligent Systems Laboratory — Manila, Philippines
Project Technical Associate II — *Jan 2025 – Jan 2026*

- Led an end-to-end AI vehicle-counting and traffic-policy system: real-time detection and counting across camera angles, plus traffic forecasting for holidays, special events, and ordinary days.
- Co-supervised research teams totaling 8 members: undergraduate researchers on API development, automation, and edge-case analysis, and interns on CVAT annotation quality. Supervised a professional transitioning into AI, including a comparative study of auto-annotation tools.

De La Salle University, Intelligent Systems Laboratory — Manila, Philippines
Research Assistant (full-time Dec 2023 – May 2024; part-time 2020 – May 2023) — *2020 – May 2024*

- Supported the smart-shelf thesis research through experiment design, data collection, system integration, and validation.
- Contributed to active-learning research that reduces annotation effort for retail visual analytics, and to cloud- and network-based automated video annotation.
- Led component research and power modeling for an autonomous mobile robot with SLAM and speech recognition: NVIDIA Jetson Xavier NX, Intel RealSense, and LiDAR across 17 suppliers.

APPLIED AI EXPERIENCE

KDCI (Key Discovery Consulting, Inc.) — Pasig City, Philippines
AI Specialist (AI Team Lead) — *Jan 2026 – Present*

- Founding engineer of the company's AI team. I take agentic-AI systems to production with evaluation harnesses and guardrails.
- **Evaluation design.** A 250-sample model A/B test raised verified evidence from 86.9% to 99.0% at ~5× lower cost when classifying a ~1,600-provider AI-vendor directory (CoreIndex).
- **Human-in-the-loop customer-service AI.** Graded draft accuracy rose from 36% in the first graded week to 97% in the latest, sustaining 90%+ monthly accuracy, with the last two graded weeks at 95.5% (above the 95% target). The error rate fell from 71% to 8%. Every reply is human-approved.
- **Voice AI.** Built Elaine, the company's inbound voice agent on kdci.co. It answers from a RAG knowledge base, and quoted prices come only from a pricing tool, never from the model.
- **Enablement.** Top-rated trainer (4.98/5, NPS +90) in the company's AI Foundations pilot, and author of its AI data-governance framework.

Supervaise, Inc. Manila, Philippines
Artificial Intelligence Engineer *Jan 2025 – Jan 2026*

- **License-plate recognition.** Re-architected the pipeline from 108.6 s to 11.2 s runtime (−90%). Contributed to a system reaching 90.61% detection mAP and 90.08% recognition accuracy, deployed on NVIDIA Jetson.
- **MLOps.** Built retraining automation (TAO Toolkit, YOLOv4-tiny, pruning, FP16/INT8 export) with experiment tracking, dataset fingerprinting, and reproducibility packages. Found and fixed a validation-set data-leakage flaw in the benchmark pipeline.
- **Annotation and synthetic data.** Pre-annotation with T-Rex2 and SAM halved annotation time, and I explored ComfyUI / Stable Diffusion domain randomization to adapt models to new camera sites.

TEACHING & AI EDUCATION

- **Teaching Assistant, DLSU** (Jul 2022 – Jan 2026). Supported 500+ engineering students in Programming Fundamentals (C, MATLAB) and the Intelligent Systems Laboratory (k-NN, gradient descent, neural networks).
- **NVIDIA AI Philippines** (Oct 2022 – Jan 2026). Founding team member and technical lead of a 2,000+ member community. Organized and co-taught NVIDIA Deep Learning Institute workshops, including a hybrid workshop with 252 participants from 17+ universities.
- **Government and enterprise AI workshops** (2025). Developed curriculum and taught at regional-government and enterprise AI-enablement workshops on prompt engineering, RAG research workflows, and AI assistants (40–90+ participants each).

SELECTED AWARDS

- National Champion, IECEP Interscholastic Quiz Show 2022; Regional 2nd Runner-Up, IECEP-MSC 2022.
- Gold Undergraduate Thesis Nominee, DLSU Department of Electronics and Computer Engineering (2023).
- Team Lead, BPI DataWave Hackathon 2025 (HARAYA cultural-intelligence fintech platform).
- NVIDIA DLI certificates: Fundamentals of Deep Learning (2022); Building LLM Applications with Prompt Engineering (2025).

SKILLS

- **Computer vision and ML:** PyTorch, OpenCV, YOLO, NVIDIA DeepStream/TAO, Jetson, CVAT, FiftyOne, scikit-learn
- **LLMs and agents:** evaluation design, RAG, guardrails, model routing, OpenAI and Gemini APIs, Claude Code, ElevenLabs
- **Data and engineering:** Python, R, MATLAB, SQL/PostgreSQL, Kafka, AWS, Docker, GitHub Actions, pytest
- **Languages:** Filipino (native), English

REFERENCES

Available upon request.