Hangyeol Kang

hangyeol013@gmail.com | Portfolio: hangyeolkang.ch | LinkedIn | GitHub

Summary

AI engineer (Ph.D. in Computer Science, Nov. 2026) who builds ML systems that end up in production: a defect-inspection system running in production at a semiconductor-parts manufacturer, LLM contract-analytics pipelines at Trafigura, and an agentic LLM robot platform run live at 12 international events. Works end to end, from data collection and model design to deployment and handover. 4 first-author publications. Available from January 2027.

Technical Skills

LLM & Agents: LangGraph, LangChain, LlamaIndex, AWS Bedrock, Ollama, RAG & Multimodal RAG, Fine-Tuning (LoRA, QLoRA), LLM Evaluation
Vision & ML: PyTorch, HuggingFace Transformers, OpenCV, Object Detection, Anomaly Detection, Generative Models
Engineering: Python, SQL, PostgreSQL, Git, Docker, Linux, AWS, Azure, on-site GPU deployment
Languages: English (Fluent), French (Intermediate), Korean (Native)

Experience

Independent AI Consultant & Developer Oct. 2025 – Present
Clients in manufacturing (Korea) and architecture (Switzerland) *Remote & on site*

- **Semiconductor defect detection, in production.** Built from scratch the surface-inspection system of HSCK, a maker of 1.5 cm semiconductor parts: on-site data collection, vision models, operator app, deployment on the factory PC.
- Cut inspection time per lot by over 90% (30–45 min to 2–3 min) and the shipped defect rate from 10–15% to under 1%; 96% F1 on pass/fail at 1.5 s per part on one GPU. Selected and funded by a Korean government smart-factory programme.
- **Swiss building rules to CAD, working prototype.** LLM pipeline for an architecture office that reads federal, cantonal and communal building regulations (1,900+ documents), computes the legal building envelope of a parcel and generates an Archicad-ready IFC model, with every value traceable to its article.

AI/LLM Consultant & Developer (part-time, 20%) Jan. 2026 – Jun. 2026
Trafigura (Commodity Trading) *Geneva, Switzerland*

- Designed and built from scratch an LLM pipeline on AWS Bedrock that extracts optionality from commodity-trading contracts and feeds a quantitative pricing library to value it per contract, working with risk analysts on the pricing theory.
- Built a second pipeline for storage contracts: extraction from scanned PDFs, linking of documents into contract families and version lineages, and change detection between versions. Validated both on real contracts and handed them over to the risk analytics team as documented code.

Ph.D. Researcher in AI Systems Dec. 2022 – Nov. 2026 (Expected)
University of Geneva, MIRALab *Geneva, Switzerland*

- Designed and built the LLM interaction layer of the humanoid robot Nadine: a ten-agent LangGraph system and a ReAct agent with long-term and visual memory (AAMAS 2026).
- Fine-tuned 1.5B LLMs via QLoRA that beat their 22B teacher model (up to 98.7% accuracy) while cutting latency by 53.5%, so the full agent stack runs on the robot's own workstation.
- Ran Nadine live at 12 public events (3× ITU AI for Good Global Summit, UNDRR Global Platform, ICAO Assembly, Exhibition of Inventions Geneva) and designed and analysed two user studies with 123 participants.
- 4 first-author publications: AAMAS, Int. J. Social Robotics, The Visual Computer, Computer Animation and Virtual Worlds. Advisors: Prof. N. Magnenat Thalmann, Prof. S. Voloshynovskiy.

Machine Learning Research Intern Mar. 2022 – Sep. 2022
Veolia Research & Innovation (VERI) *Maisons-Laffitte, France*

- Tested whether GAN-generated images fix extreme class imbalance in sewer-inspection data (23 defect classes); showed that standard augmentation beat GAN augmentation on the rare class.
- Traced weak rare-class performance to mislabelled samples, which redirected the project toward systematic data-quality work.

Honors & Recognition

2025 – Wiley Top Viewed Article (Computer Animation and Virtual Worlds); featured on *Cosmopolis*, Léman Bleu TV
2024 – Best Technical Demo Award, 41st Computer Graphics International Conference (CGI 2024)
2021–2022 – Campus France Scholarship (French Government) for M.Sc. at École Polytechnique
2017–2021 – Academic Excellence & Leadership Scholarships, KyungHee University

Education

University of Geneva, *Ph.D. in Computer Science: Social Intelligence for Robotics using LLMs* *2022 – 2026 (exp.)*

École Polytechnique (IP Paris), *M.Sc. in Artificial Intelligence, Highest Honors (dual degree with KyungHee)* *2021 – 2022*

KyungHee University, *M.Eng. in Electronic Engineering, GPA 4.2/4.3 (dual degree with Polytechnique)* *2020 – 2021*

KyungHee University, Seoul, *B.Sc. in Electronic Engineering (incl. military service)* *2013 – 2020*