Jihoon Lee

Staff ML Engineer building production ML, LLM systems, and AI agents for semiconductor engineering, with a Ph.D. in aerospace flight control

jihoon91.lee@gmail.com | jihoonlee91.github.io | Seoul, Republic of Korea | LinkedIn | GitHub | Google Scholar | ORCID

SUMMARY

I build production ML, LLM systems, and AI agents for semiconductor engineering at Samsung Electronics. Before that, my Ph.D. in aerospace engineering focused on flight control, guidance, and optimization for UAVs. The common thread is reliable decisions for complex physical systems under uncertainty.

EXPERIENCE

Memory MTC AX/PI Team, Samsung Electronics Mar 2023 – Present

Staff Engineer — Production AI & ML Systems

- Own end-to-end delivery of production ML systems for advanced memory semiconductor engineering — from problem scoping with engineers through modeling, validation, release, and post-release monitoring.
- Work embedded with process and equipment engineering teams across technology development and mass production as a forward-deployed AI/ML partner, turning ambiguous engineering questions into deployable model-based tools and iterating on user feedback.
- Build predictive and optimization models that hold up under real manufacturing conditions — tool-to-tool variation, drift, measurement noise, and scarce experimental data.
- Serve self-hosted LLMs on in-house GPU supercomputing infrastructure, keeping engineering data inside controlled environments, and contribute to the team's agent-based AI for process development — LLM agents for engineering knowledge retrieval and multi-step investigations (RAG, tool calling, Model Context Protocol, multi-agent orchestration with long-term memory), traced and evaluated in production.

Flight Dynamics and Control Lab, Seoul National University Sep 2014 – Feb 2023

Graduate Student Researcher — Aerospace GNC & Autonomous Systems

- Conducted doctoral research in guidance, navigation, and control for UAVs and aerospace systems, with emphasis on morphing-aircraft modeling, nonlinear and LPV control, and optimization.
- Developed and validated algorithms for autonomous carrier landing, lunar-orbiter attitude control, target tracking, and indoor search-and-rescue path planning.
- Applied MATLAB/Simulink, Python, C/C++, numerical optimization, machine learning, and high-fidelity simulation to research prototypes and source-code deliverables.
- Contributed to funded research programs with government and industry partners, including ADD, MOTIE, KFI, and LIG Nex1; results were disseminated through journal and conference publications.

EDUCATION

Seoul National University Sep 2014 – Feb 2023

Ph.D., Aerospace Engineering (MS-PhD Integrated Course) — Department of Mechanical and Aerospace Engineering, College of Engineering. Flight Dynamics and Control Lab (Advisor: Prof. Youdan Kim). Dissertation: "Self-Scheduled Parameter-Varying Control of Asymmetric Variable-Span Morphing Unmanned Aerial Vehicle"

Yonsei University Feb 2010 – Aug 2014

B.S., Mechanical Engineering (Advisor: Prof. Woongsup Yoon) — Thesis: "Modeling and PIDE Control Simulation of a Quadrotor" (Advisor: Prof. Jongsoo Lee)

Yonsei University Mar 2013 – Aug 2014

B.S., Astronomy (Double Major Program)

SKILLS

LLM Systems & Agents	Self-Hosted LLM Serving (vLLM) on GPU Supercomputing, LLM Gateway & Routing (LiteLLM), Multi-Agent Orchestration & Agent Memory, Retrieval-Augmented Generation, Tool Calling / Model Context Protocol (MCP), LLM Tracing & Evaluation (Langfuse), Human-in-the-Loop Decision Support, AI Coding Agents (Claude Code, OpenCode)
Production ML & MLOps	PyTorch, scikit-learn, Predictive Modeling & Uncertainty Quantification, Model Validation, Drift & Monitoring, Training → Release → Retraining Pipelines, MLflow, Docker, HPC / GPU Clusters, TensorFlow
Data Engineering	PostgreSQL / MySQL, ClickHouse, MongoDB / Neo4j, Apache Airflow, Feature Engineering, Data Integration & Cleansing
Programming	Python, SQL, C / C++, MATLAB / Simulink, TypeScript / JavaScript, Linux / Shell
Domains	Semiconductor Manufacturing (Memory), Machine Learning, Control, Optimization, Modeling & Simulation, Motion Planning, Filtering, Statistical Modeling & Time-Series Analysis
Web & Product Engineering	React / Next.js, React Native (Expo), Node.js, Supabase / PostgreSQL, Playwright / Vitest
Languages	English (Advanced), Korean (Native)

AWARDS

Grand Prize (Transport Minister's Award) — 3rd Aviation-Specialized University Conference, Mayfield Hotel, Seoul, Republic of Korea (Feb 2016) — for "Risk Evaluation Scheme in Automatic Aircraft Carrier Landing Using Artificial Neural Network"

SELECTED PUBLICATIONS

43 publications (8 journal articles, 34 conference papers, Ph.D. dissertation); 239 citations, h-index 9 (Google Scholar, Nov. 2026). Full list: jihoonlee91.github.io/publications.html

1. Seokwon Lee, **Jihoon Lee**, Somang Lee, Hyunjin Choi, Youdan Kim, Seungkeun Kim, Jinyoung Suk, "**Sliding mode guidance and control for UAV carrier landing**," *IEEE Transactions on Aerospace and Electronic Systems, Vol. 55, No. 2, pp. 951-966, 2019*. doi:10.1109/TAES.2018.2867259 [87 citations]
2. **Jihoon Lee**, Youdan Kim, "**Neural network-based nonlinear dynamic inversion control of variable-span morphing aircraft**," *Proceedings of the Institution of Mechanical Engineers, Part G: Journal of Aerospace Engineering, Vol. 234, No. 10, pp. 1624-1637, 2020*. doi:10.1177/0954410019846713 [30 citations]
3. **Jihoon Lee**, Seong-hun Kim, Seungyun Jung, Hanna Lee, Youdan Kim, "**Linear parameter-varying control of variable span-sweep morphing aircraft**," *AIAA SciTech 2019 Forum, San Diego, CA, USA, Jan. 2019*. doi:10.2514/6.2019-0106 [30 citations]
4. **Jihoon Lee**, Heein Park, Youdan Kim, Chan Gook Park, Jae Hong Lee, "**Multi-level indoor path planning and clearance-based path optimization for search and rescue operations**," *IEEE Access, Vol. 11, pp. 40930-40943, 2023*. doi:10.1109/ACCESS.2023.3269981 [19 citations]
5. Hanna Lee, Seong-hun Kim, **Jihoon Lee**, Youdan Kim, "**Control Design Using Policy-Gradient-Based Integral Reinforcement Learning and Extended State Observer for Morphing Aircraft**," *IEEE Transactions on Aerospace and Electronic Systems, Vol. 60, No. 5, pp. 6447-6460, 2024*. doi:10.1109/TAES.2024.3403543 [12 citations]