

# AYE AYE MAW

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## PROFESSIONAL SUMMARY

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AI-driven autonomy researcher with 7+ years of experience in UAV/UAM safety, digital twin systems, and multi-agent reinforcement learning. Proven leadership in multi-million-dollar government-industry collaborations (Hyundai, Korea Airports, NRF), with 5+ SCI/SCIE publications, patents, and graduate supervision. Seeking to advance autonomy and digital twin technologies for next-generation aerospace and robotics applications.

## EDUCATION

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- 2015 – 2021 Ph.D. in Aerospace Information Engineering, **Konkuk University**, Seoul, South Korea  
Thesis: *An Improved Anytime Dynamic A\* Algorithm with Q-Learning for Real-time Mission Planning of Autonomous Aerial Vehicle*  
Summary: Developed an integrated heuristic search (Anytime Dynamic A\*) and reinforcement learning framework for real-time UAV path planning under uncertainty, validated in simulation using ROS and AirSim.  
Supervisor: Prof. Jae-Woo Lee
- 2011 – 2013 B.C.Sc. (Hons) in Computer Science, **University of Computer Studies**, Yangon, Myanmar  
Thesis: *Web-based Information System for Student Management*
- 2008 – 2012 B.C.Sc. in Computer Science, **University of Computer Studies**, Yangon, Myanmar

## SKILLS

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AI & Autonomy	Reinforcement learning, mission/path planning, decision support
Aerospace Systems	UAV operations, UAM safety, manned-unmanned teaming, trajectory optimization
Simulation & Digital Twin	Isaac, Unreal Engine, Unity, AirSim, VR/AR validation
Programming	Python, C++, C#, TensorFlow, PyTorch, GPU acceleration
Leadership	Project management, industry collaboration, graduate supervision
Languages	Burmese (Native), English (Professional), Korean (Professional)

## WORK EXPERIENCE

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### **Research Professor & AI Applications Team Leader**

*KADA Institute, Konkuk University, Seoul, South Korea*

Dec 2022 – Present

- Designed and implemented real-time multi-objective motion planning algorithms integrating trajectory optimization for UAVs and robotic systems.
- Led multi-disciplinary collaborations in robotics, AI, and aerospace engineering, producing high-quality publications and simulation-based decision support tools.
- Supervised graduate students and research assistants; contributed hands-on to ROS-based control and Unreal/AirSim digital twin prototypes.

### **Postdoctoral Research Associate**

*KADA Institute, Konkuk University, Seoul, South Korea*

Mar 2021 – Nov 2022

- Developed and evaluated multi-agent motion planning/control algorithms for UAVs and collaborative robotic systems.
- Built large-scale simulation frameworks for human-robot coexistence, multi-objective optimization, and trajectory adaptation in dynamic environments.
- Contributed to digital twin architectures integrating perception, planning, and human-centered design for enhanced operator awareness.

### **Research Assistant**

*Konkuk University, Seoul, South Korea*

Mar 2015 – Feb 2021

- Conducted Ph.D. research on real-time mission/path planning under uncertainty using improved Anytime Dynamic A\* and reinforcement learning.
- Supported national defense and aerospace projects on UAV autonomy, digital twin simulation, and multi-agent mission planning.
- Published in peer-reviewed SCI/SCIE journals and presented findings at international conferences.

## PROJECTS

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### **AI Digital Twin for Smart Urban Air Mobility (UAM)**

NRF Korea (2020–2028)

Role: Project Manager. Led development of digital twin and simulation systems (Unity, Unreal Engine), integrating AI-based optimization for UAM operational safety.

### **Manned–Unmanned Teaming Decision Support System**

Korea Defense (2023–2026)

Role: Project Manager & Core Researcher. Designed reinforcement learning-based mission planning methods and built high-fidelity simulators in Unreal Engine for collaborative UAV operations.

### **AI-based Multi-Agent Mission Planning (iADA\* + RL)**

ADD Program (2019–2021)

Ph.D. graduation project. Developed iADA\* with reinforcement learning for real-time multi-agent UAV planning under uncertainty and partial observability. Published in *Applied Sciences*.

## AI Object Recognition Simulator Equipment

Unitech Co., Korea (2021–2022)

Role: Project Manager. Built simulation environments in Unreal Engine for deep learning-based object detection, supporting mission planning and replanning.

## VR-based UAV Flight Simulator

KAIA & KCEI (2018–2021)

Role: Technical Leader. Developed VR-based UAV flight simulator using Unity and wearable display devices, enhancing pilot training and system validation.

## UAM Technology Roadmap

Hyundai MnSoft (2021)

Role: Core Researcher. Contributed to establishing strategic UAM technology roadmap, aligning with Hyundai's future mobility initiatives.

## PUBLICATIONS

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- [1] Aye Aye Maw, Tun Lwin, Maxim Tyan, Jae-Woo Lee, and Sangho Kim. “Efficient approach to database integration for an aerospace vehicle design and certification framework”. In: *Advances in Engineering Software* 118 (2018), pp. 27–34. ISSN: 0965-9978. DOI: <https://doi.org/10.1016/j.advengsoft.2018.01.001>. URL: <https://www.sciencedirect.com/science/article/pii/S0965997817307445>.
- [2] Aye Aye Maw, Maxim Tyan, and Jae-Woo Lee. “iADA\*: Improved Anytime Path Planning and Replanning Algorithm for Autonomous Vehicle”. In: *Journal of Intelligent & Robotic Systems* 100.3-4 (2020), pp. 1005–1013. DOI: [10.1007/s10846-020-01240-x](https://doi.org/10.1007/s10846-020-01240-x). URL: <https://doi.org/10.1007/s10846-020-01240-x>.
- [3] Aye Aye Maw, Maxim Tyan, Tuan Anh Nguyen, and Jae-Woo Lee. “iADA\*-RL: Anytime Graph-Based Path Planning with Deep Reinforcement Learning for an Autonomous UAV”. In: *Applied Sciences* 11.9 (2021). ISSN: 2076-3417. DOI: [10.3390/app11093948](https://doi.org/10.3390/app11093948). URL: <https://www.mdpi.com/2076-3417/11/9/3948>.
- [4] Zin Win Thu, Dasom Kim, Junseok Lee, Woon-Jae Won, Hyeon Jun Lee, Nan Lao Ywet, Aye Aye Maw, and Jae-Woo Lee. “Multivehicle Point-to-Point Network Problem Formulation for UAM Operation Management Used with Dynamic Scheduling”. In: *Applied Sciences* 12.22 (2022). ISSN: 2076-3417. DOI: [10.3390/app122211858](https://doi.org/10.3390/app122211858). URL: <https://www.mdpi.com/2076-3417/12/22/11858>.
- [5] Nan Lao Ywet, Aye Aye Maw, Tuan Anh Nguyen, and Jae-Woo Lee. “YOLOTransfer-DT: An Operational Digital Twin Framework with Deep and Transfer Learning for Collision Detection and Situation Awareness in Urban Aerial Mobility”. In: *Aerospace* 11.3 (2024). ISSN: 2226-4310. DOI: [10.3390/aerospace11030179](https://doi.org/10.3390/aerospace11030179). URL: <https://www.mdpi.com/2226-4310/11/3/179>.
- [6] Nan Lao Ywet, Aye Aye Maw, and Jae-Woo Lee. “Deep Learning-Driven DAA System for UAVs with Frenet Trajectory Optimization”. In: *International Journal of Control, Automation, and Systems* 23 (2025). ISSN: 2780–2796. DOI: [10.1007/s12555-025-0180-9](https://doi.org/10.1007/s12555-025-0180-9).

- [7] Nan Lao Ywet, Aye Aye Maw, and Jae-Woo Lee. “R-YOLO: Enhancing Takeoff/Landing Safety in UAM Vertiports with Deep Learning Model”. In: *IEEE Access* 13 (2025). DOI: [10.1109/ACCESS.2025.3571435](https://doi.org/10.1109/ACCESS.2025.3571435).

## PATENTS

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- [1] Jae-Woo Lee, Aye Aye Maw, and Maxim Tyan. “AI-based Route Planning Method for Autonomous UAV”. Patent. Application Number: 10-2021-0004537. 2022.
- [2] Maxim Tyan, Le Viet Thang Nguyen, Aye Aye Maw, GuMoon Jang, and Jae-Woo Lee. “High-Precision Flight Simulation Device and Method for Unmanned Aerial Vehicles Equipped with Electric Propulsion System”. Patent. Application Number: 10-2021-0058662. 2022.

## REFERENCES

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### **Professor Jae-Woo Lee, Ph.D.**

PhD Advisor

Professor, Department of Aerospace and Mechanical Engineering

Director, Konkuk Aerospace Design·Airworthiness Institute (KADA)

Konkuk University, Seoul, South Korea

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### **Professor Maxim Tyan**

Academic Senior

Associate Professor, Department of Mechanical Engineering

New Uzbekistan University, Tashkent, Uzbekistan

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