Minsu **Woo**

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Education

Dankook University — **Cheonan, Korea**
Ph.D. in Industrial Engineering — *2025–present*
Integrated M.S./Ph.D. program. Advisor: Prof. Sung Won Cho (COIS Lab)

Dankook University — **Cheonan, Korea**
B.S. in Industrial Engineering — *2019–2025*

Research Interests

Combinatorial optimization, decomposition methods, and neural combinatorial optimization, with applications in maritime logistics, port operations, and supply chains.

Publications

† corresponding author

Journal Articles

1. **Woo, M.**, Yoo, T., Lee, Y., Cho, S. W.†, Jung, W. S., Kim, J., Park, J. H., & Nanda, A. (2026). Emerging technology forecasting for the VHF data exchange system in maritime wireless communication. *Journal of Marine Science and Technology*, 31(2), 349–359.

Conference Proceedings

2. **Woo, M.**, Kim, H., Kim, H., Zhou, Y., & Cho, S. W.† (2026, July). Neural column generation for quay crane scheduling. In *International Conference on Logistics and Maritime Systems* (pp. 27–39). Cham: Springer Nature Switzerland. [Best Paper Award]

Under Review

3. **Woo, M.**, Kim, H., Kim, J., & Cho, S. W.† Risk-aware sourcing–inventory integration model for the anode material supply chain. *Maritime Economics & Logistics*.
4. Lee, S., **Woo, M.**, & Cho, S. W.† Optimizing batch picking and order sequencing to minimize reshuffling in robotic compact storage and retrieval systems. *European Journal of Operational Research*.
5. Cho, H., Choi, S. C., **Woo, M.**, & Cho, S. W.† Deep reinforcement learning for online order insertion in multi-tote storage and retrieval autonomous mobile robot systems. *Computers & Industrial Engineering*.

In Preparation

6. **Woo, M.**, Kang, D., Kim, C., & Cho, S. W.† Verifiable security framework for Lua script execution in S-100 systems.
7. **Woo, M.**, Kim, H., Kim, J., Yoo, T., & Cho, S. W.† TDMA slot assignment for efficient VHF data exchange in maritime wireless networks.

Presentations

1. **Woo, M.**, Kim, H., Kim, H., Zhou, Y., & Cho, S. W.† (2026, July). Neural column generation for quay crane scheduling. Oral presentation, *14th International Conference on Logistics and Maritime Systems* (*LOGMS 2026*) *& EUROMar 2026*, Barcelona, Spain.
2. **Woo, M.**, Yoo, T., Choi, S. C., & Cho, S. W.† (2025, August). Cost-efficient QCASP under time-variant surcharge policies in container terminals. *13th International Conference on Logistics and Maritime Systems* (*LOGMS 2025*), Shanghai, China.
3. **Woo, M.**, Yoo, T., & Cho, S. W.† (2025, November). MILP-based TDMA slot optimization for efficient resource allocation in VDE-TER maritime communication systems. Invited talk, *2025 KIEES Annual Meeting and Fall Conference*, Seoul, Korea. (in Korean)

Projects

Information Exchange Framework for Maritime AI Collision Avoidance Systems
KRISO project *Jul. 2026–Dec. 2026*

- Analysis of interface requirements and operational scenarios for integrating waterway information with AI-based collision avoidance

Integrated Smart Farming Management System for Paddy-Field Crops
Rural Development Administration project *Apr. 2026–Dec. 2026*

- Decision-support logic for cultivation planning and resource coordination across rice, wheat, garlic, onion, and potato

Quay Crane Assignment Model Considering Surcharge Policies
Dankook University project *Mar. 2026–Feb. 2027*

- Mathematical optimization model for crane deployment and workload allocation under time-dependent surcharge conditions

Dynamic Cell Planning (DCP) Algorithm
Industry-sponsored project *Sep. 2025–Nov. 2025*

- Optimization model for maritime communication cell planning based on vessel traffic and channel usage

VOOST (VDES interOperability & Optimal Service Test-bed)
Ministry of Oceans and Fisheries R&D project *Apr. 2024–present*

- MIP model for VDES base-station resource allocation over frequency channels, TDMA channels, and time slots
- Column generation algorithm based on Dantzig–Wolfe decomposition for the TDMA slot assignment problem

Honors & Awards

2026: Best Paper Award, LOGMS 2026 & EUROMar 2026

2025: Excellence Award, 2025 National Policy Research Competition on Supply Chain Stabilization (MOTIE, KEIT)

2025: Excellence Award, 2025 Logistics Data Utilization and Analysis Idea Competition (Daejeon Information & Culture Industry Promotion Agency)

2025: Encouragement Award, 24th Radio Technology Paper Competition (KCA, KIEES)

2024: Excellence Award, 19th Intellectual Property Paper Competition (KIPO)

Side Projects

KBO Magic Number Dashboard
cois.dankook.ac.kr/Tools/kbo *2026–present*

- Led collaborative development of a web-based dashboard for daily KBO postseason clinching and elimination numbers, using a Gurobi-based MILP model and scheduled automated updates

Timetable Optimization System (TOS)
cois.dankook.ac.kr/Tools/tos *2025–present*

- Collaborative development of a web-based timetable optimization tool for generating feasible schedules under instructor, room, time-slot, and curriculum constraints