

Curriculum Vitae

Changui Lee, Ph.D.

Assistant Professor, Division of Marine System Engineering, Korea Maritime and Ocean University

Deputy Head of Maritime Autonomous System Safety Center

Brief introduction

Dr. Changui Lee is an assistant professor at the National Korea Maritime and Ocean University (KMOU). His area of specialization is software engineering, with a particular focus on the safety of software systems in the maritime sector. Since joining KMOU in 2023, he has been teaching and researching maritime software-related subjects and conducting research projects in collaboration with the maritime industry.

From 2009 to 2020, he worked as a team leader in a corporate research institute in the maritime sector, where he designed and developed software systems. From 2020 to 2023, he was with the Korea Conformity Laboratory, where he evaluated and certified the quality of software systems.

Currently, his research focuses on the safety of AI software and its standardization for smart and autonomous ships.

Address and Contacts

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Current occupation

- 2023-present Assistant Professor, National Korea Maritime and Ocean University
- Division of Marine systems engineering of College of Maritime Science for undergraduate program
 - Maritime AI&Cyber Security, Marine Information Technology and Computer engineering for graduate program

Education and Training

- 2020-2023 Ph.D. National Korea Maritime and Ocean University (Computer engineering)
- 2018-2020 M.S. National Korea Maritime and Ocean University (Computer engineering)
- 2003-2009 B.S. National Korea Maritime and Ocean University (Computer engineering)

Academic awards

- 2023 Best Paper Award (Korea Digital Contents Society)
- 2021 Best Paper Award (Korea Digital Contents Society)

Certifications from special programs

- 2024 International AI Process Provisional Assessor, KAPA, South Korea
- 2022 Smart Factory Assessor, Ministry of SMEs and Startups, South Korea
- 2020 Software System and Functional Safety Assessor, Korea Laboratory Accreditation Scheme (KOLAS), South Korea
- 2015 Maintenance Course of Kongsberg Dynamic Positioning System(K-Pos), Kongsberg Maritime, Norway
- 2012 Program of Marine Electronics Installer, National Marine Electronics Association (NMEA), U.S.A

Research and Development projects (recent five years)

- 2024-2028 Standardization of functional safety standards for smart ship software quality assurance (participant)
- 2023-2027 Standardization of hydrographic information for smart ship (participant)
- 2023-2026 Development of VHF Data Exchange System (participant)
- 2021-2025 Development of integrated digital platform for the road and transport Infrastructure based on crowdsourcing (participant)
- 2021-2026 Development of Eco-friendly and Highly Efficient Last Mile Delivery Technology for Environmental Load Reduction (participant)
- 2020-2022 Development of smart facility management system for industrial boiler considering software functional safety (group leader)
- 2018-2022 Development of integrated digital platform for the road and transport Infrastructure based on crowdsourcing (participant)

Activities in Academic and Standardisation Societies

2023 - present	Deputy Head of Maritime Autonomous System Safety Center
2020 - present	Member of Korea Multimedia Society (KMMS) and Korea Digital Content Association (DCS)
2009 - present	Member of Korean Society of Marine Engineering (KOSME)

Patents

2023	Risk assessment method thereof for maritime AI system safety (PCT)
2023	Risk assessment method thereof for maritime AI system safety (South Korea)
2020	Remote Monitoring and Diagnosing System of Ship Equipment Using Simulator and Method Thereof (South Korea)
2020	Remote Monitoring and Diagnosing System of Ship Equipment Capable of Data Transmission by Mobile Device and Diagnosis by Simulator and Method Thereof (South Korea)
2020	Remote Diagnosing Forecasting System of Ballast Water Treatment System and Method Thereof (South Korea)
2018	System and Method for Testing Dynamic Positioning Controller System of a Marine Vessel (South Korea)
2017	System and Method with an Analog Signal Simulator for Testing Dynamic Positioning Controller System of a Marine Vessel (South Korea)
2017	System with Data Collection Unit for Testing Dynamic Positioning Controller System of a Marine Vessel (South Korea)
2012	Remote support services system over VSAT, VSAT Through Remote support services system (South Korea)

Publications (recent five years)

Journals

1. **Lee, C., & Lee, S.** (2023). Vulnerability of Clean-Label Poisoning Attack for Object Detection in Maritime Autonomous Surface Ships. Accepted in *Journal of Marine Science and Engineering*, 11(6). SCIE
2. **Lee, C., & Lee, S.** (2023). Overcoming the DDoS Attack Vulnerability of an ISO 19847 Shipboard Data Server. Accepted in *Journal of Marine Science and Engineering*, 11(5). SCIE
3. **Lee, C., & Lee, S.** (2023). Evaluating the Vulnerability of YOLOv5 to Adversarial Attacks for Enhanced Cybersecurity in MASS. Accepted in *Journal of Marine Science and Engineering*, 11(5). SCIE
4. **Lee, S., Lee, C., Kim, G., Na, H., Kim, H., Lee, J., & Park, M.** (2022). A Study of S-100 Based

Product Specifications from a Software Implementation Point of View. Accepted in *The Journal of Navigation*, 75(5). SCIE

5. **Lee, C.**, & Lee, S. (2022). Experiment on Countermeasures against Cyber Security Vulnerabilities Using Redundancy of ISO 19847 Shipboard Data Serve. Accepted in *Korea Multimedia Society*, 25(6).
6. **Lee, C.**, Kim, H., & Lee, S. (2022). Analysis of Safety Considerations for Application of Artificial Intelligence in Marine Software Systems. Accepted in *Korean Institute of Navigation and Port Research*, 46(3).

Conferences

1. Cho, H., Jeong, H., Kim, H., **Lee, C.**, & Lee, S. (2024). Experiment on Processing Navtex Messages using Bi-LSTM CRF Model. *Proceedings of the 2024 Spring Conference of The Korean Association of Ocean Science and Technology Societies, Journal of Korean Institute of Navigation and Port Research*.
2. Kim, H., Jeong, H., Cho, H., **Lee, C.**, & Lee, S. (2024). Analysis of Hydrographic Data Encoding based on S-100 Standard for Machine Readability. *Proceedings of the 2024 Spring Conference of The Korean Association of Ocean Science and Technology Societies, Journal of Korean Institute of Navigation and Port Research*.
3. Lee, S., **Lee, C.**, Kim, H., Jeong, H., & Cho, H. (2023). An analysis of Feature Redundancy for Applying new Maritime Data Exchange Standard, S-100. *Korea Digital Contents Society 2023 Autumn Comprehensive Academic Conference and Undergraduate Research Paper Conference*.
4. Lee, S., **Lee, C.**, Kim, H., Jeong, H., & Cho, H. (2023). Experiment on Automatic Collection and Classification Algorithm of Marine Accident History for Ship Accident Prone Area Services. *Korea Digital Contents Society 2023 Autumn Comprehensive Academic Conference and Undergraduate Research Paper Conference*.
5. Lee, S., **Lee, C.**, Kim, H., Jeong, H., & Cho, H. (2023). Analysis of the possibility of VDES to implement chart services for ship operations. *Korea Digital Contents Society 2023 Autumn Comprehensive Academic Conference and Undergraduate Research Paper Conference*.
6. Lee, S., **Lee, C.**, Kim, H., Jeong, H., & Cho, H. (2023). Design of a Service Area Calculation Algorithm for Ship Under-Keel Clearance Management and Experimental Validation Using DEVS. *Korea Digital Contents Society 2023 Autumn Comprehensive Academic Conference and Undergraduate Research Paper Conference*.
7. Lee, S., **Lee, C.**, Kim, H., Jeong, H., & Cho, H. (2023). Experiment on Ship Engine Room Image Generation using Artificial Intelligence Image Generative Models. *Korea Digital Contents Society 2023 Autumn Comprehensive Academic Conference and Undergraduate Research Paper Conference*.
8. **Lee, C.**, & Lee, S. (2021). Implementation of ISO/IEC 19847 Ship Data Server Applied Functional Safety. *Korea Digital Contents Society Summer Comprehensive Academic Conference and Undergraduate Research Paper Conference*.
9. **Lee, C.**, & Lee, S. (2021). Adjustment Needs on ISO/IEC 19847 for Ship Data Server Implementation. *The Korean Society of Marine Environment and Safety 2021 Spring Academic Conference*.

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