Curriculum Vitae

Seojeong Lee, Ph.D.

Brief introduction

Seojeong Lee is a professor of Korea Maritime and Ocean University (KMOU). Her specialized area is software engineering including software design and software quality, with a focus on maritime area. Since 2005 as joining KMOU, she has been teaching and researching maritime software related subjects and conducting research projects with maritime industries.

During 2009 and 2018, she has been representing Republic of Korea at the Navigation, Communication, Search and Rescue (NCSR) Subcommittee of International Maritime Organisation (IMO) as well as at the e-NAV Committee of International Aids-to-navigation Lighthouse Association (IALA).

Currently, the main part of her academic interests are AI software safety, the new standard for electronic navigational chart S-100 for autonomous vessels.

Current occupation

2005– present Professor, 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

2003 Executive Course of Carnegie Mellon University and Software Engineering Institute (CMU/SEI) Fully granted by Korea Government

1993-1998	Ph.D. Sookmyung Women`s University (Computer science, Software engineering)
1989-1991	M.S. Sookmyung Women`s University (Computer science, Neural networks)
1985-1989	B.S. Sookmyung Women`s University (Computer science)

Academic awards

2021	Best Paper Award (Korea Digital Contents Society)
2021	Academic Award (DCS-2021-09)
2018	Best Paper Award DCS(Korea Digital Contents Society)
2018	Excellent Professional Service Award DCS(Korea Digital Contents Society)

Certifications from special programs

2015	Integrated Software Dependent Systems (ISDS), DNV GL, South Korea
2004	S/W Process Improvement-CMMI, Korea IT Industry Promotion Agency, South Korea
2004	Intensive Workshop for Models of software systems, IST, KAIST, South Korea
2003	Program of Advanced Software Engineering, Software Engineering Institute in Carnegie Mellon University, U.S.A
2003	CMM-Integrated/Stage Representation, Software Engineering Institute in Carnegie Mellon University, U.S.A
2003	Team Software Process Executive Strategy, Software Engineering Institute in Carnegie Mellon University, U.S.A

Research and Development projects (recent five years)

2023~2027	Standardisation of hydrographic information for smart ship (participant)
2023~2026	Development of VHF Data Exchange System (group leader)
2021~2022	Development of automated ship equipment demonstration scenarios (leader)
2021~2023	Development of autonomous ship technology (participant)
2019~2000	Global forum project-Smart ship navigation special interest group (leader)

2016~2018	Development of SW platform and system for ship safe navigation using meteorological, environmental and ship information based on IEC61162-450 standard (leader)

Activities in Academic and Standardisation Societies

2019 - present	Chair of Smart Ship Navigation Special Interest Group (SSN SIG)
Early 2000~present	Director of Korea Multimedia Society (KMMS) and Korea Digital Content Association (DCS)
2005 - present	Member of Korean Society of Marine Engineering (KOSME) and Korean Institute of Navigation and Port Research (KINPR)
2009 - 2018	International Maritime Organisation (IMO) Navigation, Communication, Search and Rescue (NSCR) sub-committee as representing Republic of Korea
2008 - 2015	e-NAV Committee of International Aids-to-navigation Lighthouse Association (IALA)

Patents

2022	Risk assessment method thereof for maritime AI system safety (PCT)
2022	Risk assessment method thereof for maritime AI system safety (South Korea)
2021	Method and apparatus for providing navigation guidance (South Korea)
2021	Safe route area indication system for ship's coastal navigation (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., Choi, Y., & **Lee, S**. (2022). A Study on the Quality Assessment Method for Marine GIS Software Based on S-100 Standards. Accepted in *Korean Journal of Hydrography*, *11*(2).

5. **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
6. 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).
7. 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).
8. Kim, H., Kim, G., Na, H., & **Lee, S**. (2021). An Implementation of Detecting Abnormal Ship Navigation and Ship Safety Navigation Guidance. Accepted in *Journal of Digital Contents Society*, *22*(11).
9. Kim, H., Kim, G., Lee, S., Kang, S., & **Lee, S**. (2021). Implements of Function and Symbol to Portray Safety Navigation Area. Accepted in *Journal of Digital Contents Society*, *22*(2).
10. Kim, J., **Lee, S**., & Jung, M. (2021). Case Study on the User Interface of GPS Plotters to Enhance Their Usability. Accepted in *Journal of Marine Science and Engineering*, *9*(1). SCIE
11. Jung, M., & **Lee, S**. (2020). UI Standard for Navigation Systems Challenges of Implementing New User Interface Guideline. Accepted in *Sea Technology*, *61*(12). SCIE
12. Kim, H., Kim, G., Na, H., & **Lee, S**. (2020). Development of Digital Contents Management System of Ship Navigation Information. Accepted in *Journal of Digital Contents Society*, *21*(12).
13. Kim, H., Kim, G., & **Lee, S**. (2020). Improvement of Maritime Safety Information Symbols for Electronic Navigational Charts. Accepted in *Journal of Digital Contents Society*, *21*(7).
14. **Lee, S**., & Lutzhoft, M. (2020). Human-Machine Interaction The Challenges of New Teamwork for Smart Ship Navigation. Accepted in *Sea Technology*, *61*(5). SCIE
15. Patriko, D., Doherthy, R., Lemon, N., Dung, V., **Lee, S**., & Lutzhoft, M. (2019). Getting to S-Mode: Standardising the Design of Navigation Equipment. Accepted in *Seaways*.
16. Kim, H., & **Lee, S**. (2019). Implementation of Under-Keel Clearance Management Information and Onboard Test of Supporting System for Safety Navigation. Accepted in *Journal of Digital Contents Society*, *20*(6).
17. Jeong, J., Jung, M., & **Lee, S**. (2018). Eye Gaze Analysis of Ferry Navigators for Improving Usability of Navigational Equipment. Accepted in *Journal of Digital Contents Society*, *19*(11).
18. Jeong, J., Jung, M., & **Lee, S**. (2018). Ship Navigation Simulation Test for Area-of-Interest Analysis Using Eye Tracker. Accepted in *Journal of Digital Contents Society*, *19*(10).
19. Jeong, J., Jung, M., Jeon, J., Jeon, G., & **Lee, S**. (2018). Development and User Test of Standard Navigational Tasks to Improve User Interface of Navigational Equipment. Accepted in *Journal of Digital Contents Society*, *19*(10).
20. Kim, H., Mun, C., & **Lee, S**. (2018). Design and Implementation of Portrayal Engine for S-129Under Keel Clearance Information Display. Accepted in *Journal of Digital Contents Society*, *19*(8).
21. Kim, H., Mun, C., & **Lee, S**. (2018). Analysis and Experiment of Portrayal Process Based on S-100 Standard of Marine Safety Information. Accepted in *Journal of Digital Contents Society*, *19*(7).

Conferences

1. Kim, H., & **Lee, S**. (2023). IHO S-100 Data Model and Relevant Product Specification. *TransNav 2023 15th International Conference on Marine Navigation and Safety of Sea Transportation*.
2. Jung, M., Kim, H., **Lee, S**., Ahn, Y, & Lutzhoft, M. (2022.). Considerations to Develop a Systematic Handover Methodology between AI and Human. *The Korean Society of Marine Environment and Safety 2022 Spring Academic Conference*.
3. Kim, H., Kim, G., & **Lee, S**. (2022). A Study of Demonstration Procedure for Onboard Ship Equipment. *The Korean Association of Ocean Science and Technology Societies 2022 Joint Academic Conference*.
4. Kim, H., Kim, G., Park, Y., Kim, D. won, Kim, S., & **Lee, S**. (2022). A Study on Considerations for Development of Onboard Demonstration Scenarios. *The Korean Association of Ocean*

Science and Technology Societies 2022 Joint Academic Conference.

5. **Lee, S**. (2021). Rendezvous for AI+Shipping and Ship -Platform and Test-. *AI + Shipping and Shipbuilding Industry Convergence Conference*.
6. **Lee, S**. (2021). SW Functional Safety for Autonomous Ships. *2021 International Software Safety Conference*.
7. Kim, H., Kim, G., Na, H., & **Lee, S**. (2021). Analysis of portrayal issues on electronic chats systems for ship navigation. *Journal of Korea Multimedia Society 2021 Autumn Academic Conference*.
8. **Lee, S**. (2021). Introducing AI and Cyber-Security Education to Maritime Science College. *2021 The 19th Asia Maritime & Fisheries Universities Forum (AMFUF)*.
9. Kim, H., Yang, Y., Joung, T., & **Lee, S**. (2021). Human Factor and Ergonomic Issues in Maritime Autonomous Surface Ships. *2021 ERGOSHIP*.
10. 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*.
11. Kim, H., Kim, G., & **Lee, S**. (2021). A Study on Consideration for Portrayal of Symbols of Electronic Navigational Chart Based on S-100. *Korea Digital Contents Society Summer Comprehensive Academic Conference and Undergraduate Research Paper Conference*.
12. Kim, H., Kim G, Lee, C., & **Lee, S**. (2021). Interoperability Considerations amongst S-100 Based Product Specifications. *2021 The 17th International Conference on Multimedia Information Technology and Applications (MITA)*.
13. 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*.
14. Kim, H., Kim, G., & **Lee, S**. (2021). An Analysis of User Perspective for Symbols of Maritime Safety Information. *The Korean Society of Marine Environment and Safety 2021 Spring Academic Conference*.
15. Kim, G., Kim, H., Na, H., Kim, H., & **Lee, S**. (2021). Analysis of Existing Research to Prepare for Ship's GPS Malfunction. *The Korean Society of Marine Environment and Safety 2021 Spring Academic Conference*.
16. **Lee, S**. (2019). Improving Symbols of Korean Hydrographic Information. *S-100 Working Group (s-100 Test Strategy Meeting)*.
17. **Lee, S**. (2019). Orchestrating IT, OT and Data Farming for Maritime Industry. *E-Navigation Underway 2019 Asia Pacific*.
18. Kim, H., Jeong, J., & **Lee, S**. (2018). Survey on DevOps and Agile methods. *The Korea Digital Contents Society 2018 Joint Academic Conference*.
19. Kim, H., Jeong, J., & **Lee, S**. (2018). Software test tools applicable to DevOps environment. *The Korea Digital Contents Society 2018 Joint Academic Conference*.
20. Kim, H., & **Lee, S**. (2018). Feature and Portrayal Catalogue for Marine Casualty Based on S-100. *2018 International Conference on Digital Contents*.
21. Shim, H., Jung, J., & **Lee, S**. (2018). A Comparison of Ship Navigators' Eye Movements on a Real Seagoing Ship and Ship Navigation Simulator. *2018 International Conference on Digital Contents*.
22. Kim, H., Jeong, J., Shim, H., Shin, I, & **Lee, S**. (2018). Development of Test Procedures for Marine Embedded Application SW and Case Study. *The Korean Association of Ocean Science and Technology Societies 2018 Joint Academic Conference*.
23. Shim, H., Kim, H., Jeong, J., Shin, I, & **Lee, S**. (2018). A Survey on Usability Test-Related Standards as a Previous Work for Developing Test Procedures for Marine Embedded Application SW. *The Korean Association of Ocean Science and Technology Societies 2018 Joint Academic Conference*.
24. Jeong, J., Kim, H., Shim, H., Shin, I, & **Lee, S**. (2018). Development of Test Procedures for Marine Embedded Application SW Usability Testing and Case Study. *The Korean Association of Ocean Science and Technology Societies 2018 Joint Academic Conference*.
25. **Lee, S**. (2018). Software Quality Assurance and Its Functional Safety - Vital for Increasing Levels of Autonomy. *Navigation Safety Symposium 18*.
26. Jeong, J., Kim, H., Shim, H., Shin, I., & **Lee, S**. (2018). A Study of Consideration for Development of Marine Embedded Application SW Test Procedure. *The Korea Digital*

Contents Society 2018 Joint Academic Conference.

27. Kim, H., Jeong, J., Shim, H., Shin, I., & **Lee, S**. (2018). Consideration for Development of Marine Embedded Application SW Usability Testing Test Procedure. *The Korea Digital Contents Society 2018 Joint Academic Conference*.
28. Shim, H., Kim, H., Jeong, J., Shin, I., & **Lee, S**. (2018). A Survey on SQA-related Standards for Development of Marine Embedded Application SW Test Procedure. *The Korean Society of Marine Engineering 2018 Spring Academic Conference*.