Curriculum Vitae

Dr. Jiwoong Lee

Summary

Jiwoong Lee is an Assistant Professor of Marine Engineering Technology at Texas A&M Galveston. He gained experience as a 1st Engineer on various types of vessels, including car carriers, ore carriers, and general cargo ships, for five years. He achieved his Ph.D. in Internal Combustion Engine from Korea Maritime & Ocean University. I worked six years conducting job training required by STCW for seafarer at the Korea Institute of Maritime and Fisheries Technology. Following that, he taught and conducted research in the Marine Engineering at Korea Maritime University for five years. His research focuses on performance/failure diagnostic technology of marine diesel engine, efficiency enhancement technologies through performance optimization of ship propulsion engines and techniques to reduce greenhouse gas emissions from vessels. He developed a vessel speed reduction program that is applied to ships entering Korean ports to mitigate fine dust and greenhouse gas emissions, contributing to improvements in port air quality and aligning with policy goals. He has also contributed to the Korean shipbuilding industry through the standardization of Ship's alarm I.O lists for sharing smart ship platform. Currently, he is engaged in research and development related to energy-efficient monitoring and greenhouse gas reduction technologies.

Contact

Department of Marine Engineering Technology
Texas A&M University at Galveston

Mobile: +1 346 542 6102
Office: +1 409 740 4431
E-mail: woongsengine@tamug.edu

Education

Bachelor, Korea Maritime & Ocean University, Ship machinery, 2003

Master, Korea Maritime & Ocean University, Mechanical engineering, 2012

Ph. D, Korea Maritime & Ocean University, Internal combustion engine, 2017

A Study on Application of Miller Cycle for Marine Two-stroke Diesel Engine

Research Area

Green ship technology, Autonomous ship technology, Diesel engine fault diagnosis, Diesel engine performance prediction, Emission from ship

Work Experience

(Aug. 2023 – present) Texas A&M Galveston

Affiliation: Department of Marine Engineering Technology

Assistant Professor, responsible for lectures and research

(Sep. 2018 – July. 2023) Korea Maritime & Ocean University

Affiliation: Department of Marine System Engineering

Associate Professor, responsible for lectures and research

Lectures: Internal Combustion Engine, Marine Engine, Marine Propulsion System, Engine Room Simulator

Participated in 24 R&D national research projects in the shipbuilding/ocean field, and 8 projects as a responsible researcher.

(Jan. 2012 – Aug. 2018) Korea Institute of Maritime and Fisheries Technology,

Associate Professor of Seafarers Education under the Ministry of Maritime Affairs and Fisheries and responsible for the education, training and research of seafarers

Team Leader, Offshore training team, Mar. 2016 – Aug. 2018

Developed offshore employee training course, acquired OPITO Training Certification and NI Training Certification

Team Member, Engineer's training team, Mar. 2014 – Feb. 2016

Ship engineer job training – Engineer's Practice, Engine maintenance, MARPOL, Marine Engine

Team Member, Ocean Polytech team, Jan. 2012 – Feb. 2014

Ship engineer training – Marine Engine, Marine Propulsion system

(Mar. 2003 – Mar. 2008) STX Pan Ocean (shipping company),

Responsible for the operation and maintenance of ship equipment as a ship engineer (first-class engineer) of a large merchant ship

Equipment in charge: Main Engine, Generator Engine, Marine Boiler, Ballast water system, Stern tube system

Task and Role: Team Leader of Engine department, Engine room resource management, Operation and maintenance of engine equipment, Oil Bunkering

Performance of administrative duties

Associate Dean, Office of Student Affairs, Korea Maritime & Ocean University, 2021-2022

Faculty Director, Division of Marine System Engineering, Korea Maritime & Ocean University, 2020-2021.

Team Leader, Offshore training team, Korea Institute of Maritime and Fisheries Technology, 2017-2018.

R&D projects

- Integrated management technology development for greenhouse gas (GHG) emissions from ships, Ministry of Oceans and Fisheries, 2023. Principal Investigator ($200,000)
- Development of ship main engine fault diagnosis system, Samsung Heavy Industries Co., Ltd. 2023, Principal Investigator ($20,000)
- Development and Demonstration of the Ammonia Fuel Supply System for Ships / Development of Core Technologies for Medium and Large Eco-Friendly Ships to Respond to IMO Greenhouse Gas Regulations, Ministry of Trade, Industry and Energy, 2022. Principal Investigator ($70,000)
- Development of low-cost, high efficiency sensor system for the performance diagnosis of propulsion system of autonomous vessels, National Research Foundation of Korea, 2022, Principal Investigator ($ 20,000)
- Development of Algorithms for Optimizing Performance and Minimizing Greenhouse Gas by Cylinders Combustion Diagnosis of Ship Main and Power Generating Systems, National Research Foundation of Korea, 2021, Principal Investigator ($ 20,000)
- Development of Big Data-based Performance/Efficiency Monitoring (EEXI) Algorithm for Ship Greenhouse Gas Reduction (1st year), National Research Foundation of Korea, 2021-2023, Principal Investigator ($ 90,000)
- A Study on the Development of Emission Algorithm for Monitoring Air Pollutants by ocean going vessel, Ministry of Oceans and Fisheries, 2021, Principal Investigator ($ 50,000)
- A Study on the Operational Status and Improvement of the Vessel Speed Reduction Program, Ministry of Ocean and Fisheries, 2020, Principal Investigator ($ 70,000)
- A Study on the Introduction and Operation of the Vessel Speed Reduction Program, Ministry of Ocean and Fisheries, 2019, Principal Investigator ($ 120,000)
- Development of Data-Based Diagnostic Algorithm by Regression Analysis of Main Generator Engine, Samsung Heavy Industries Co., Ltd. 2019, Principal Investigator ($ 30,000)

Publication

1. Baek, H.-M.; Jung, G.-S.; Vuong, Q.D.; Lee, J.-U.; Lee, J.-W. Effect of Performance by Excessive Advanced Fuel Injection Timing on Marine Diesel Engine. *Applied Sciences* **2023**, *13*, 9263.
2. Lee, J.-U.; Lee, W.-J.; Jeong, E.-S.; Noh, J.-H.; Kim, J.-S.; Lee, J.-W. Algorithm for Monitoring Emissions Based on Actual Speed of Ships Participating in the Korean Vessel Speed Reduction Program. *Energies* **2022**, *15*, 9555.
3. Park, M.-H.; Chakraborty, S.; Vuong, Q.D.; Noh, D.-H.; Lee, J.-W.; Lee, J.-U.; Choi, J.-H.; Lee, W.-J. Anomaly Detection Based on Time Series Data of Hydraulic Accumulator.

Sensors **2022**, *22*, 9428.

4. Vuong, Q.D.; Kim, J.; Choi, J.-H.; Lee, J.-u.; Lee, J.-w.; Jeon, H.; Noh, J.-H.; Yoon, S.H.; Lee, W.-J. Study on the Variable Speed Diesel Generator and Effects on Structure Vibration Behavior in the DC Grid. *Applied Sciences* **2021**, *11*, 12049.
5. Baek, H.M.; Kim, W.J.; Kim, M.K.; Lee, J.W. Preparation for the greenhouse gas emission issues in the national defense. *Journal of Advanced Marine Engineering and Technology (JAMET)* **2022**, *46*, 277-289.
6. Vuong, Q.D.; Lee, J.-w.; Lee, W.-J.; Choi, H.; Seo, K.; Kim, Y.; Jeong, J.H.; Song, M.-h.; Lee, J.-u. Establishing the True Dynamic Bending Moment of Propeller Shaft Using a Single Bridge of Strain Gauge. *Applied Sciences* **2022**, *12*, 9235.
7. Lee, J.-W.; Vuong, Q.D.; Jeong, B.; Lee, J.-u. Changes in propeller shaft behavior by fluctuating propeller forces during ship turning. *Applied Sciences* **2022**, *12*, 5041.
8. Kwon, W.-S.; Vuong, Q.D.; Choi, J.-H.; Lee, J.-u.; Lee, J.-w.; Yoon, S.H.; Nyongesa, A.J.; Park, M.-H.; Yang, S.-K.; Lee, W.-J. Study on the Propeller Rope Cutter Concerning Transient Torsional Vibration Due to Cutting Action. *Applied Sciences* **2022**, *12*, 1628.
9. Cho, M.-G.; Lee, J.-W. Analysis of effects of and potential improvements for vessel speed reduction program. *J. Korean Soc. Mar. Eng* **2022**, *46*, 47-55.
10. Lee, J.-w.; Baek, H.-M.; Lee, J.-u.; Roh, B.-S.; Park, K.; Lee, W.-J. Application of educational simulator of two-stroke marine diesel engine. *Journal of Advanced Marine Engineering and Technology (JAMET)* **2021**, *45*, 447-458.
11. Baek, H.-M.; Lee, J.-U.; Lee, J.-W. High expansion cycle for marine 2-stroke engine. *Journal of Advanced Marine Engineering and Technology-Vol* **2021**, *45*, 100-107.
12. Lee, J.-w.; Lee, J.-u. Effect of Propeller Eccentric Thrust Change on Propusion Shafting System. *Journal of the Korean Society of Marine Environment & Safety* **2021**, *27*, 1082-1087.
13. Lee, J.; Jung, G.-S.; Lee, W.-J. Causes of Top Dead Center Error in Marine Generator Engine Power-Measuring Device. *Journal of the Korean Society of Marine Environment & Safety* **2020**, *26*, 429-435.
14. 백현민; 김철규; 서정훈; 이원주; 이지웅. 순항속력 작전요구도 조정을 통한 함정 운용성능 개선 효과 연구. *Journal of Advanced Marine Engineering and Technology (JAMET)* **2019**, *43*, 687-692.
15. 노범석; 이원주; 이지웅; 김재호; 김대희; 최재혁. 가상현실 (VR) 을 이용한 선박주기관 교육· 훈련 시스템 개발에 관한 연구. *해양환경안전학회지* **2019**, *25*, 735-742.
16. Lee, W.-J.; Kim, D.-Y.; Choi, J.-H.; Lee, J.-W.; Kim, J.-S.; Son, K.; Ha, M.-J.; Kang, J. Utilization of petroleum coke soot as energy storage material. *Energies* **2019**, *12*, 3195.
17. Beak, H.-m.; Seo, J.-h.; Lee, W.-j.; Lee, J.-w. Study on the performance factors of two stage turbo-charging system and maximization of the Miller cycle. *Journal of the Korean Society of Marine Environment & Safety* **2019**, *25*, 953-960.

18. 이지웅; 백현민; 최재성; 조권회. 선박용 저속 2 행정기관의 밀러사이클 효과의 향상. *Journal of Advanced Marine Engineering and Technology (JAMET)* **2017**, *41*, 793-800.
19. 두현욱; 강석용; 채병근; 이지웅. 선박평형수 관리 선박직원 교육 매뉴얼 개발에 관한 연구. *수산해양교육연구* **2017**, *29*, 976-986.
20. 백현민; 이지웅; 정균식; 최재성. V 타입 디젤엔진의 성능 예측에 관한 연구. *Journal of Advanced Marine Engineering and Technology (JAMET)* **2017**, *41*, 501-506.
21. Baek, H.; Lee, J.; Jeong, K.; Choi, J. Theoretical investigation for characteristics of Miller cycle. *Journal of the Korean Society of Marine Engineering* **2017**, *41*, 507-513.
22. Lee, J.; Baek, H.; Han, K.; Rho, B.; Choi, J. Application of Miller cycle for two-stroke marine diesel engine. *Journal of the Korean Society of Marine Engineering* **2017**, *41*, 523-528.
23. Jung, G.-s.; Lee, J.-w. A study on an instantaneous angular velocity and torque fluctuation for marine diesel engine. *Journal of Advanced Marine Engineering and Technology* **2015**, *39*, 722-728.
24. Bae, J.-w.; Lee, J.-w.; Jung, K.-s.; Choi, J.-s. Prediction of matching performance of two-stage turbo-charging system design for marine diesel engine. *Journal of Advanced Marine Engineering and Technology* **2015**, *39*, 626-632.
25. Lee, C.-H.; Lee, J.-W.; Chae, J.-J. A Study on Education Curriculum for Human Resource of Offshore Plant. *Journal of Fisheries and Marine Sciences Education* **2014**, *26*, 498-509.
26. Jang, H.-S.; Lee, J.-W.; Lee, K.-K.; Choi, J.-S. Prediction of NO x emission for marine gas engines. *Journal of Advanced Marine Engineering and Technology* **2014**, *38*, 658-665.
27. Jung, C.-h.; Rho, B.-s.; Lee, J.-W.; Choi, J.-s. Predictions of the deteriorating performance for the marine diesel engines. *Journal of Advanced Marine Engineering and Technology* **2013**, *37*, 47-52.

Technical Reports

- Development of Algorithms for Optimizing Performance and Minimizing Greenhouse Gas by Cylinders Combustion Diagnosis of Ship Main and Power Generating Systems, National Research Foundation of Korea, 2021
- Development of Big Data-based Performance/Efficiency Monitoring (EEXI) Algorithm for Ship Greenhouse Gas Reduction (1st year), National Research Foundation of Korea, 2021
- A Study on the Development of Emission Algorithm for Monitoring Air Pollutants by ocean going vessel, Ministry of Oceans and Fisheries, 2021
- A Study on the Operational Status and Improvement of the Vessel Speed Reduction

Program, Ministry of Ocean and Fisheries, 2020

- A Study on the Introduction and Operation of the Vessel Speed Reduction Program, Ministry of Ocean, and Fisheries, 2019
- Development of Data-Based Diagnostic Algorithm by Regression Analysis of Main Generator Engine, Samsung Heavy Industries Co., Ltd. 2019
- A Study on the High Expansion Cycle for Improving the Performance of Ship Diesel Engines, Korea Maritime and Ocean University, 2018
- Development of EC61162-450-based ship safety support SW platform and system using weather, environment and hull information, National IT Industry Promotion Agency, 2019

Intellectual property rights

- (Program) Marine Two-stroke Diesel Engine Education Program, C-2020-018439
- (Patent) Failure Detection Method and System for Marine Engine, 10-2268733
- (Patent) Electricity Supply System for Ship Equilibrium Water Tank Air Flow-Based Generation System and Ship Emergency Equipment, 10-2249656

Certificate

- 1st level ship engineer, Ministry of Ocean and Fisheries
- Training Course for Maritime Instructors, 2017, World Maritime University
- ME-GI Engine Seminar, 2017, MAN PrimeServ.
- Customized 2-stroke Diesel Engine Course, 2016, MAN PrimeServ.
- ME Engine Troubleshooting, 2016, MAN PrimeServ.
- Training Course for Maritime English Instructors, 2016, IMO & KIMFT
- Electrical System for Oil & Gas Production Platform for Train the Trainer, 2015, TPTI
- Dynamic Positioning Maintenance K-Pos, 2014, EMAS
- English Communication program, 2009, Pacific Gateway College