Mingi Jeong

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Website: https://mingijeong.github.io/
Repo: https://github.com/MingiJeong/

Interests

How can we create ***persistent and robust robot decision-making systems*** capable of functioning in ***complex, unstructured environments*** where intelligent systems can have a profound societal impact in areas such as environmental monitoring, search and rescue, and cargo or passenger transportation?

I am passionate about investigating: Marine Robot, Full stack autonomy, Autonomous navigation, Autonomous Surface Vehicle, In-water obstacle detection and tracking, Obstacle avoidance, Topological (homotopy) planning, Intention-aware collision avoidance, Learning-augmented planner, Multi-robot system, Multi-criteria decision-making, Pareto-optimality, Environmental monitoring, Optimized design and building, Reliance-aware sensor fusion

Education

2019 – Present **Dartmouth College**, (NH, USA)
Ph.D. candidate in Computer Science – *expected to graduate in June 2025*

Korea Maritime and Ocean University, (Busan, Korea)
2017 – 2019 M.Eng. of Maritime Safety Environment Engineering
2007 – 2012 B.Sc. in Maritime Police Science – *Valedictorian*

2010 – 2011 **Maritime College – State University of New York**, (NY, USA)
Exchange student in *International Transportation and Trade Major*

Research Experience

2019 – Present **Dartmouth Reality and Robotics Laboratory**
Research Assistant (Advisor: Professor Alberto Quattrini Li)

- As part of EPSCoR project (NSF grant No. 1923004) – Computational Methods and Autonomous Robotics Systems for Modeling and Predicting Harmful Cyanobacterial Blooms, involving multiple institutions: Dartmouth College, Bates College, Colby College, University of New Hampshire, University of Rhode Island, University of South Carolina, I designed and developed autonomous robotic boat for environmental monitoring
  - Main lead of building, design, operation, deployment, software stack of custom robotic boats ⇒ Over 5 years of successful deployments, and operation by non-roboticists including lake and coastal waters, with more than 4 TB data with over 150 hours of runtime.
  - Main lead of training sessions for the boat operation, data handling for collaborating institutions including over 15 undergrads, post-doc, and professors ⇒ used during biology classes for students in Colby College, Dartmouth College
- As part of DUCK project for the defense of urban cities from hacking and drone attacks, I designed and developed autonomous search and track modules for decision-making in surveillance scenarios ⇒ Introduced active search and tracking of multiple dynamic targets method 1.3 to 3.2 times faster for task completion and open-source implementation for the community

2017 – 2019 **Coast Guard Laboratory**, Korea Maritime and Ocean University
Research Assistant (Advisor: Professor Eun-Bang Lee)

- As part of a national R&D project on the development of management technology for Hazardous and Noxious Substances (HNS) accidents by the Ministry of Oceans and Fisheries in Korea, 2017-2018 (total 8 years, 18 million USD), I developed multi-criteria route planning and risk contour mapping ⇒ foundational technology for route planning of Maritime Autonomous Surface Ships (MASSs) and Autonomous Surface Vehicles (ASVs) by shipping companies. The entire project's impact and performance were selected as the best national R&D project.
- As part of in national R&D project on fundamental research on maritime accident prevention by Ministry of Oceans and Fisheries (MOF) in Korea, 2017, I surveyed marine accidents by communication failures and devised a manual for shipping companies ⇒ A textbook based on our works was published by MOF and used by shipping companies to reduce marine accidents from miscommunication [B1]
- As part of research project on enhancement of investigation and response to marine accident by Korea Shipowners' Association, 2017-2018, I surveyed accident analysis methods and proposed preventive approaches of human errors ⇒ A policy-making proposal based our works was presented at a seminar held by MOF with over 200 experts in marine-related fields and the guidance was used by shipping companies to reduce marine accidents
- As part of a governmental project on policy development plan of coast guard system by Korea Coast Guard, 2017, I analyzed coast guard resources by developing a data mining tool and proposed a framework on cutting-edge coast guard technologies ⇒ Korea Coast Guard uses our guidance on resource allocation to enhance its capability to monitor coastal waters in Korea

Professional Experience

7/2022 – 9/2022 **Sea Machines Robotics Inc. (Boston, USA)**
Software Engineer Intern, Autonomy team and Perception team

- Set up, configured a LiDAR sensor for data collection on-board autonomous boat
- Built perception stack packages: *real-time calibration of LiDAR—camera fusion, adaptive clustering for LIDAR*, in addition to heterogeneous sensor drivers, covering *full stack development* based on ROS2 with Docker ⇒ the company uses the software and hardware configuration for its entire fleet and collects data from 2022
- Participated in marine captain's council to promote products as per market needs

4/2012 – 12/2016 **Hyundai Merchant Marine Co., Ltd (Busan, Korea)**
Chief Mate (Final Rank, promoted from Third and Second Mate)

- Served as navigation officer on Liquefied Natural Gas (LNG) vessels and Container Vessels
- Supervised new building and dry dock of large LNG vessels:
  - $174K$ vessel (289 m) 'MARIA ENERGY' at Hyundai Heavy Industries, Korea
  - $150K$ vessel (288 m) 'NEO ENERGY' at Keppel shipyard, Singapore
  - $135K$ vessel (289 m) 'HYUNDAI OCEANPIA' at MMHE shipyard, Malaysia
- Evaluated from the supervisors and the head resource management to be on the 99 *percentile* among all employees in terms of performance

- Developed operation manual of container vessels for foreign crews ⇒ shared to and used by the container fleet (approximately total 70 vessels) and the company
- Developed operation manual of Electronic Chart Display and Information System (ECDIS) ⇒ shared to and used by the entire fleet (approximately total 100 vessels) and the company after implication by the international convention

Selected Honors and Awards

2024 ***RSS Pioneer***, 30 pioneers across the world, Robotics Science and Systems (RSS)

Nomination to the Best Workshop Paper Award, "Multi-modal Perception Dataset of In-water Objects for Autonomous Surface Vehicles" [IW1], IEEE-RAS Technical Cluster on "Robots for Unstructured Environments"

IEEE RAS Travel Award, 1,000 USD for IROS, Robotics Automation Society

Young Researcher Travel Award, 2,000 USD for IROS, Ministry of Oceans and Fisheries and Korea Institute of Marine Science & Technology Promotion

2023 ***Best Poster Award***, "*Towards Robust Autonomous Navigation System by Robotic Boat under High-traffic Environments*" Graduate Student Poster Session, Dartmouth College

Pioneer Researcher Award, "*Challenges and Real-world Validation of Autonomous Surface Vehicle Decision making System*" [DW1], Korean Institute of Navigation and Port Research

2022 ***Best Presentation Paper Award***, "*Towards Full Pipeline Development of Decision-making for Autonomous Surface Vehicles in Challenging Aquatic Environments*" [IW2], Korean Scientists and Engineers Association

2019 ***Best Award***, Naval Architecture and Marine Expert Project, fully sponsored visit (OECD, Bereau Veritas, NorShipping in France, Norway), Daewoo Shipbuilding & Marine Engineering Co., Ltd.

Future Ocean Technologist Award, "*Multi-criteria Route Planning with Risk Contour Map for Smart Navigation*" [J4], fully sponsored visit to Antarctic Sejong science station, Minister (Ministry of Ocean and Fisheries in Korea)

2018 ***Best Presentation Paper Award***, "*A Study on Object-oriented Route Design for Ships Carrying HNS*" [DW2], Korean Society of Marine Environment & Safety

Best Presentation Paper Award, "*A Study on Optimal Route Plan of Ships Carrying HNS*" [IW5], Korean Institute of Navigation and Port Research

2012 ***Award for Graduation with Distinction***, Korea Maritime and Ocean University

2011 ***Admiral's List***, Maritime College – State University of New York

Grant and Scholarships

2023 – 2024	10,000 USD, **MOGAM Science Foundation (Artificial Intelligence)**: merit-based scholarship supporting overseas study in STEM
	20,000 USD, **NOAA (National Oceanic and Atmospheric Administration) SeaGrant**, Grant No. PZL0376 — *"Toward a team of low-cost robotic boats for monitoring and surveying in coastal waters"*
2022	2,000 USD, KSEA-KUSCO Scholarship, Korean-Amercian Scientists and Engineers Association (KSEA): merit-based scholarship supporting Korean-American students
2019	Approximately 24,000 USD, **Global Marine Scholar Sponsorship, Korea Marine Pilot Association**: merit-based scholarship supporting overseas study in maritime navigation
2017–2018	Full tuition, Research Assistant Scholarship, Korea Maritime and Ocean University: scholarship supporting research track during masters
2010–2011	Full tuition, Hyundai Education Scholarship, Hyundai Merchant Marine: merit-based scholarship supporting the undergraduate study and guaranteed employment
	1,000 USD, Alumni Heritage Scholarship, Maritime College – State University of New York: merit-based scholarship supporting Sea Term on Training Ship Empire State
	24,000 USD, **Rotary International Ambassadorial Scholarship, Rotary Foundation**: scholarship supporting overseas study as an ambassador
2007– 2010	Full tuition, Best Honors Scholarships, Korea Maritime and Ocean University: merit-based scholarship supporting a student with the highest GPA

Invited Talks and Interviews

2024	"*Towards Full Pipeline Maritime Autonomy by Autonomous Surface Vehicle under Challenging and Uncertain Environments*", The Marine and Fisheries Science and Technology Innovation Forum (*AI and Futuristic Ships*) with over *400* participants, organized by Ministry of Oceans and Fisheries [LINK]
	"*Active Collision Avoidance by Intention-awareness*", MERRIC (Mechanical Engineer and Robotics) [LINK]
	"*Active Learning-augmented Intent-aware Obstacle Avoidance of Autonomous Surface Vehicles in High-traffic Waters*", selected speaker among over 100 submissions, Northeast Robotics Colloquium (NERC) [LINK]
	"*Robust Perception and Navigation of Autonomous Surface Vehicles in Challenging Environments*", Inha University, Korea
	"*Robust Perception and Navigation of Autonomous Surface Vehicles in Challenging Environments*", KRISO (Korea Research Institute of Ships & Ocean Engineering)
	"*Chief Mate to aquatic roboticist*", Korea Maritime and Ocean University
2023	"*Towards Robust Navigation by Autonomous Surface Vehicles under High-traffic Aquatic Environments*", MERRIC (Mechanical Engineer and Robotics) [LINK]
	"*Development of Decision-making Technology for Autonomous Surface Vehicles*", Pioneer researcher interview, MERRIC (Mechanical Engineer and Robotics) [LINK]
2021	"*Discovering the aquatic world with robots*", STEM Enrichment Youth (STEMEY)

Publications

Fully-refereed International Conference Papers

[C1] Jeong, M. (*First Author*), Chadda, A., and Quattrini Li, A., 2024, "Active Learning-augmented Intention-aware Obstacle Avoidance of Autonomous Surface Vehicles in High-traffic Waters," Proceedings of IEEE International Conference on Intelligent Robots and Systems (IROS), Abu Dhabi, U.A.E, pp. 10005-10012, [LINK] ***Published.***

[C2] Masaba, K., Roznere, M., Jeong, M. (*Co-Author*), Quattrini Li, A., 2024, "Persistent Monitoring of Large Environments with Robot Deployment Scheduling in between Remote Sensing Cycles", Proceedings of IEEE International Conference on Robotics and Automation (ICRA), Yokohama, Japan, pp. 8464-8470, [LINK] ***Published.***

[C3] Perera, R.A. T., Jeong, M. (*Co-Author*), Quattrini Li, A., Stegagno, P., 2023, "A GM-PHD Filter with Estimation of Probability of Detection and Survival for Individual Targets", Proceedings of IEEE International Conference on Intelligent Robots and Systems (IROS), Detroit, USA, pp. 9360-9366, [LINK] ***Published.***

[C4] Jeong, M. (*First Author*) and Quattrini Li, A., 2023, "MARCOL: A Maritime Collision Avoidance Decision-making Testbed", Proceedings of the AAAI Conference on Artificial Intelligence, pp. 16452-16454, [LINK] ***Published.***

[C5] Deb T., Dix J., Jeong, M. (*Co-Author*), Molinaro C., Pugliese A., Quattrini Li, A., Santos E., Subrahmanian VS, Yang S. and Zhang Y., 2023, "DUCK: A Drone-Urban Cyber-Defense Framework based on Pareto-Optimal Deontic Logic Agents", Proceedings of the AAAI Conference on Artificial Intelligence, pp. 16425-16427. [LINK] ***Published.***

[C6] Jeong, M. (*First Author*) and Quattrini Li, A., 2022, "Motion Attribute-based Clustering and Collision Avoidance of Multiple In-water Obstacles by Autonomous Surface Vehicle", Proceedings of IEEE International Conference on Intelligent Robots and Systems (IROS), Kyoto, Japan, pp. 6873-6880, [LINK] ***Published.***

[C7] Jeong, M. (*First Author*) and Quattrini Li, A., 2021, "Efficient LiDAR-based In-water Obstacle Detection and Segmentation by Autonomous Surface Vehicles in Aquatic Environments", Proceedings of IEEE International Conference on Intelligent Robots and Systems (IROS), Prague, Czech Republic, pp. 5387-5394, [LINK] ***Published.***

[C8] Roznere, M., Jeong, M. (*Co-first Author*), Maechling, L., Ward, N. K. , Brentrup, J. A., Steele, B., Bruesewitz, D., Ewing, H., Weathers, K., Cottingham, K. L., and Quattrini Li, A., 2021, "Towards a reliable heterogeneous robotic water quality monitoring system: An experimental analysis", Book chpater of International Symposium on Experimental Robotics (ISER), [LINK], ***Published.***

[C9] Jeong, M. (*First Author*) and Quattrini Li, A., 2020, "Risk vector-based near miss and real-time obstacle avoidance for autonomous surface vehicles", Proceedings of IEEE International Conference on Intelligent Robots and Systems (IROS), Las Vegas, NV, USA, pp. 1805-1812, [LINK] ***Published.***

Fully-refereed International Journal Articles

[J1] Jeong, M. (*Co-first Author*), Chadda, A., Ren, Z., Zhao, L., Liu, H., Roznere, M., Zhang, A., Jiang, Y., Achong, S., Lensgraf, S., and Quattrini Li, A., 2024, "SeePerSea: Multi-modal Perception Dataset of In-water Objects for Autonomous Surface Vehicles", to IEEE Transaction on Field Robotics, [LINK] ***Under Review.***

[J2] Jeong, M. (*First Author*), Molinaro, C., Deb, T., Zhang, Y., Pugliese, A., Santos, E., Subrahmanian, VS., and Quattrini Li, A., 2024, "Multi-Object Active Search and Tracking by Multiple Agents in Untrusted, Dynamically Changing Environments", ***Under Review.***

[J3] Deb T., Jeong, M. (*Co-Author*), Molinaro, C., Quattrini Li, A., Pugliese, A., Santos, E., Subrahmanian, VS., and Zhang, Y., 2024, "Declarative Logic-based Pareto-Optimal Agent Decision Making", IEEE Transactions on Cybernetics, [LINK] ***Published.***

[J4] Jeong, M. (*First Author*), Lee, E.-B., Lee, M., Jung, J.-Y., 2018, "Multi-criteria Route Planning with Risk Contour Map for Smart Navigation", Ocean Engineering. 172, 72-85. [LINK] ***Published.*** (🏆 **Future Ocean Technologist Award**)

[J5] Jeong, M. (*First Author*), Lee, E.-B., Lee, M., 2018, "A Study on Intuitive Technique of Risk Assessment for Route of Ships Transporting Hazardous and Noxious Substances", Journal of Navigation and Port Research. 42, 97–106. [LINK] ***Published.***

[J6] Jeong, M.-G. (*First Author*), Lee, E.-B., Lee, M., 2017, "A Study on the Visualization of HNS Hazard Levels to Prevent Accidents at Sea in Real-time", Journal of Korean Society Marine Environment and Safety. 23, 242–249. [LINK] ***Published.***

Patent

[P1] Lee, E.-B., Jeong, M. (*Co-Author*), Lee, M. "A Technique to Plan a Route Based on Risk Contour Mapping", 10-2185782, Korea. [LINK] ***Registered.***

Book

[B1] Park, J.-S., Park, K.-E., Lee, M.-G., Jeong, M. (*Co-Author*), Lee, D. "Maritime Korean languqge for seafarers", 2018, Ministry of Oceans and Fisheries, Korea. [LINK] ***Published.***

Lightly-refereed Conference

[L1] Jeong, M. (*First Author*), Roznere, M., Lensgraf, S., Sniffen, A., Balkcom, D., and Quattrini Li, A., 2020, "Catabot: Autonomous surface vehicle with an optimized design for environmental monitoring", Proceedings of MTS/IEEE OCEANS – Singapore [LINK] ***Published.*** (selected as **top 20 submissions** for student poster competition program covering the full registration and travel expenses; substituted as online due to pandemic).

[L2] Jeong, M. (*First Author*), Lee, E.-B, Park, Y.-S., and Quattrini Li, A., 2019, "A risk visualization technique based on static and dynamic data for maritime mobility", Proceedings of MTS/IEEE OCEANS – Seattle, WA. [LINK] ***Published.***

[L3] Jeong, M. (*First Author*), Lee, E.-B., Lee, M., 2018, "An Adaptive Route Plan Technique with Risk Contour for Autonomous Navigation of Surface Vehicles", Proceedings of MTS/IEEE, OCEANS 2018, Charleston, USA. [LINK] ***Published.***

Conference and Workshop Presentations

Presenting Author

International Conference (Oral Presentations)

[IW1] Jeong, M. (*Co-first Author*), Chadda, A., Ren, Z., Zhao, L., Liu, H., Roznere, M., Zhang, A., Jiang, Y., Achong, S., Lensgraf, S., and Quattrini Li, A., 2024, "Multi-modal Perception Dataset of In-water Objects for Autonomous Surface Vehicles", presentation in ICRA Field Robotics Workshop, Yokohama, Japan (🏆 **Nominated to the Best Workshop Paper Award**)

[IW2] Jeong, M., Roznere M., Masaba K., Chadda A., and Quattrini Li A., 2022, "Towards Full Pipeline Development of Decision-making for Autonomous Surface Vehicles in Challenging Aquatic Environments", UKC (US-Korea Conference), Virginia, USA (🏆 **Best presentation paper award**)

[IW3] Roznere M., Jeong, M. (*Co-first Author*), Masaba K., Trout-Haney J., Lutz D., Cottingham K., Palace M., and Quattrini Li A., 2022, "Towards context-based sampling for environmental monitoring heterogeneous robots and remote sensing technologies", presentation in ICRA Robotics for Climate Change Workshop, Philadelphia, USA

[IW4] Jeong, M., Lee, E.-B., Lee, M., 2018, "A Purpose-Oriented Technique for Route Planning of Ships based on the Concept of Risk Isoline Curves", International Association of Institutes of Navigation World Congress (IAIN) 2018, Chiba, Japan

[IW5] Jeong, M., Lee, E.-B., Lee, M., 2017, "A Study on Optimal Route Plan of Ships Carrying HNS", Hebei Spirit Oil Pollution International Conference (10 years of monitoring and the future), Incheon, Korea (🏆 **Best presentation paper award**)

Domestic Conference (Oral Presentations)

[DW1] Jeong, M., Chadda, A., and Quattrini Li A., 2022, "Challenges and Real-world Validation of Autonomous Surface Vehicle Decision making System", Fall Annual Conference, Korean Institute of Navigation and Port Research, Busan, Korea (🏆 **Pioneer Researcher Award**)

[DW2] Jeong, M., Lee, E.-B., Yoon, J.-H, Lee, M., Kang, W.-S., 2018, "A Study on Object-oriented Route Design for Ships Carrying HNS", Spring Annual Conference, Korean Institute of Navigation and Port Research, Jeju, Korea (🏆 **Best presentation paper award**)

[DW3] Jeong, M., Lee, E.-B., Yoon, J.-H., Ha, M.-J., Kim, T.-H, Lee, M., 2017, "A Study on Risk Simulation for Risk-based Readiness and Response to HNS Marine Accident", Fall Annual Conference, Korean Society of Marine Environment & Safety, Busan, Korea

[DW4] Jeong, M., Park, J.-S., Ha, W.-J., Park, K.-E., Lee, M.-K., 2017, "Language Barriers and Communication Problems under Multi-cultural Environment and Marine Accident", Fall Annual Conference, Korean Institute of Navigation and Port Research, Busan, Korea

[DW5] Jeong, M., Lee, E.-B., Lee, M., 2017,"A Study On the Risk-based Designation of Courses for Navigation of Autonomous Ships Carrying HNS", Fall Annual Conference, Korean Institute of Navigation and Port Research, Busan, Korea

[DW6] Jeong, M., Lee, E.-B., Yoon, J.-H., Ha, M.-J., Kim, T.-H, Lee, M., 2017, "A Study on the Development of the Dynamic HNS Risk Charts", Spring Annual Conference, Korean Society of Marine Environment & Safety, Mokpo, Korea

[DW7] Jeong, M., Lee, E.-B., Yoon, J.-H., Ha, M.-J., Kim, T.-H, Lee, M., 2017, "A Basic Study on the Development of Automated Risk Display System in Real-time, Spring Annual Conference", Korean Institute of Navigation and Port Research, Busan, Korea

Teaching Experience

Teaching Assistant Panel Spring 2021, Winter 2024
Panelist Speaker Dartmouth Center for the Advancement of Learning
- Shared my TA experience and responsibilities to junior graduate students: strategies for time managements, effective feedback and assessment, and resources for international students

Future Faculty Teaching Series Spring 2022
Trainee Dartmouth Center for the Advancement of Learning
- Participated in training for educational literature, course design, and instructional methods
- Ran a practice teaching and evaluation of teaching by others

Principles of robot design and programming Fall 2020, Fall 2021
Teaching assistant Dartmouth College
- Managed and ran tutorials for the fleet of Husarion ROSbot for the final assignment.
- Had weekly office hours, answered questions in person/online, and evaluated assignments

Radio electronic navigation Mar. 2017 – Dec. 2018
Tutor Korea Maritime and Ocean University
- Covered teaching of GPS, ECDIS, RADAR, AIS VHF, MF/HF, GMDSS
- Ran tutorial and training on board training ship HANBADA, had weekly office hours, answered questions in person, evaluated assignments, and proctored exams

Indoctrination and Summer Sea Term Jan. 2011 – Jul. 2011
Indoctrination Officer Maritime College – State University of New York
- Ran training of terrestrial, celestial navigation onboard Training Ship Empire State
- Ran training for newly matriculated students who are new to maritime studies

Mentorship Experience

Lab Mentor 2019 – Present
Dartmouth Reality and Robotics Lab

- *High school students*: Anirudh Pulugurtha (2023), Mihir Garimella (2023) by volunteering at New Hampshire Academy of Science (NHAS) program
- *Master students*: Ben Wolsieffer (2020-2021), Siddharth Agrawal (2020-21), Haowen Liu (2022-2023), Ziang Ren (2022-2024), Zitong Wu (2023)
- *Undergraduate students*: Sabriel Achong (2023), Edwin Onyango (2022), Ari Chadda (2021-2022), Phuc Tran (2021-present), Ivy Zhang (2023), Amy Wu (2021-2022, University of Florida), Daelim Chung (2021), Luca Chun Lit (2021), Chloe Nicolaou (2020-2021), Brian Wang (2020), Andrada Pantelimon (2020), Alex Rodriguez (2020), Lily Maechling (2020), Suzan Eskalen (2020)

EPSCoR Mentor 2021 – Present
Supporting students from other institution

- Teaching and training use of custom robotic boat Catabot, autonomy modules
- Support on-field experiment, operation, and data collection by Robotic boat Catabot
- *Undergraduate students*: Abigail Quinn (2021-present, Bates College), Lilo Wu, Hannah Braslau, Evan Ma (2021-2022, Bates College), Anna Shorb, Roujia Zhong (2021-2022, Colby College), Kenny Douyon Kim, Jack Moore (2021, Colby College)

Review Activities

Conference papers

- IEEE International Conference on Robotics and Automation (**ICRA**): 2020, 2021, 2022, 2023, 2024, 2025
- IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**): 2020, 2021, 2024
- IFRR International Symposium on Experimental Robotics (**ISER**): 2020

Journal papers

- IEEE Robotics and Automation Letters (**RA-L**): 2021, 2022, 2024
- Wiley Journal of Field Robotics (**JFR**): 2023, 2024
- Elsevier Robotics and Autonomous Systems (**RAS**): 2024

Selected Service Activities

2024	*Program committee*, RSS Pioneer workshop 2025
	Organizer, "robots in the wild", ICRA workshop 2025
	Graduate mentor, SACNAS (Society for the Advancement of Chicano/Hispanics and Native Americans in Science)
2023	*Volunteer*, New Hampshire Academy of Science (NHAS)
	Student Participant, IEEE RAS Multi-Robot Systems summer school, Prague, Czech
	Volunteer, Dartmouth College Science Day
2021 – 2022	*Cohort member*, NH SeaGrant CoastWise, cohort-based coastal immersion program
2019	*Korean representative*, fully sponsored visit to OECD, Bereau Veritas, NorShipping
	Korean representative, Antarctic Sejong science station – cancelled due to pandemic

Technical Skills

Computing

Robots	Custom built robotic boats (Catabot1,2,3,4,5,6), Ground robot Husarion ROSbot2.0, UAV DJI Mavic Mini
Sensors, components:	Velodyne VLP-16 LiDAR, Ouster OS1-64 LiDAR, Intel Real Sense, YSI EXO2 sonde, Pixhawk, RoboClaw ESC, AirMar echo sounder, Doodlelab's long-range Wi-Fi
Languagues:	Python, C++, MATLAB, R
Tools and Libraries:	ROS 1,2 (Robot Operating System), Docker, AirSim, CUDA, Pytorch, Git, Latex
Software:	ArduPilot, UnrealEngine, Gazebo, Rhino, ORCA 3D, Simerics MP, Surfer
Relevant Certificate:	Marine Big Data Professional, and Marine IoT Professional

Ship operator

- ***Chief Mate***, Endorsed license for **ships unlimited tonnage** upon oceans
- RADAR/ARPA operator, GMDSS, Liquefied cargo handling
- US Powerboating, Safe boat handling license by United States Sailing Association
- Yacht operator's license by Korea Coast Guard

References

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