

Jungseok Hong, Ph.D.

POSTDOCTORAL ASSOCIATE

Massachusetts Institute of Technology Computer Science & Artificial Intelligence Laboratory (MIT CSAIL)

✉ jungseok@mit.edu | 🏠 www.jungseokhong.com

Research Interests

Underwater Robotics, Field Robotics, Semantic Mapping, Spatial Intelligence, Multimodal Perception, Active Perception, Robot Teaming & Mobile Manipulation

Academic Employment

Postdoctoral Associate, MIT CSAIL, Advisor: John J. Leonard, *Cambridge, MA, USA*

Sep 2023 - now

Education

Ph.D. Computer Science, University of Minnesota, *Minneapolis, MN, USA*

2023

Advisor: Junaed Sattar, Committee: Nikolaos Papanikolopoulos, Catherine Zhao, Maziar Hemati

Thesis: "Toward Robotic Autonomy in Data-Scarce and Visually Challenging Environments"

M.Sc. Electrical Engineering, University of Central Florida, *Orlando, FL, USA*

2017

Advisor: Wei Sun, "A Multiagent Q-learning-based Restoration Algorithm for Resilient Distribution System Operation"

B.Sc. Electrical Engineering (Summa Cum Laude), Minor in Mathematics, South Dakota State University, *Brookings, SD, USA*

2015

Advisor: Wei Sun, "Senior Design: Design of Relay-based Protection Scheme for Wind Farm Generator Installations"

Obtained Fundamentals of Engineering Certificate (Engineer In Training)

B.Sc. Electrical Engineering (Summa Cum Laude), Sung Kyun Kwan University, *Seoul, Korea*

2015

Awarded Dual Degree with South Dakota State University

*Military service as a Staff Sergeant in the Republic of Korea Air Force (2008-2010)

Selected Awards, Fellowships, & Grants

IROS 2024 Workshop Best paper Award, Autonomous Robotic Systems in Aquaculture \$ 2,125

2024

ICRA 2023 RAS Travel Grant, IEEE Robotics and Automation Society \$ 1,300

2023

KOCSEA 2nd Place Award for Research Presentation, KOCSEA (Korean Computer Scientists and Engineers Association in America) \$ 500

2021

UMII MnDRIVE Graduate Fellowship, University of Minnesota MnDrive \$ 50,000

2019

Industrial Research Employments

Research Intern, Samsung AI Center New York, Advisor: Volkan Isler, *New York, NY, USA*

Feb 2022 - Sep 2022

Research Intern, Sentra, Advisor: Dimitris Zermas, *Minneapolis, MN, USA*

May 2020 - Aug 2020

Publications

Published 16 peer-reviewed papers (15 conference/journal papers and one workshop paper) in top-tier robotics venues, ICRA, IROS, RSS, IJRR, RA-L, and IEEE-JOE, including one **Best Paper Award** at an IROS 2024 workshop. Released two public datasets with **over 30,000** and **20,000** downloads, respectively, and hold two U.S. patents.

PUBLICLY RELEASED DATASETS

- [2] **Jungseok Hong**, Michael Fulton, Junaed Sattar, "TrashCan 1.0 An Instance-Segmentation Labeled Dataset of Trash Observations", Data Repository for the University of Minnesota (DRUM), July 2020. (Downloaded **30,000+** times as of Oct 29th 2025) [url: <https://conservancy.umn.edu/handle/11299/214865>]

- [1] Michael Fulton, **Jungseok Hong**, Junaed Sattar, “Trash-ICRA19: A Bounding Box Labeled Dataset of Underwater Trash”, Data Repository for the University of Minnesota (DRUM), July 2020. (Downloaded **20,000+** times as of Oct 29th 2025) [url: <https://conservancy.umn.edu/handle/11299/214366>]

PATENTS

- [2] **Jungseok Hong**, Suveer Garg, Jinwook Huh, Hyun Soo Park, Ibrahim Volkan Isler “Apparatus and method for self-supervised learning for visual feature representation of egocentric images”, US20240286283A1, Aug. 29, 2024.
- [1] **Jungseok Hong**, Suveer Garg, Ibrahim Volkan Isler “Probabilistic approach to unifying representations for robotic mapping”, US20240091950A1, Mar. 21, 2024.

PEER-REVIEWED CONFERENCE PUBLICATIONS

- [11] **Jungseok Hong**, Ran Choi, John J. Leonard. “Semantic Enhancement for Object SLAM with Heterogeneous Multi-modal Large Language Model Agents” Accepted for publication in the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2025.
- [10] **Jungseok Hong**, Sakshi Singh, Junaed Sattar, “IBURD: Image Blending for Underwater Robotic Detection” Proceedings of the IEEE International Conference on Robotics and Automation (ICRA) 2025. Atlanta, GA, USA.
- [9] Kurran Singh, **Jungseok Hong**, Nicholas R Rypkema, John J. Leonard. “Opti-Acoustic Semantic SLAM with Unknown Objects in Underwater Environments” Proceedings of IROS 2024. Abu Dhabi, UAE. **Best Paper Award** (Autonomous Robotic Systems in Aquaculture Workshop)
- [8] **Jungseok Hong**, Suveer Garg, Volkan Isler, “Semantic Mapping with Confidence Scores through Metric Embeddings and Gaussian Process Classification” Proceedings of ICRA 2023. London, United Kingdom.
- [7] Jinwook Huh, **Jungseok Hong**, Suveer Garg, Hyun Soo Park, Volkan Isler, “Self-supervised Wide Baseline Visual Servoing via 3D Equivariance” Proceedings of IROS 2022. Kyoto, Japan.
- [6] Michael Fulton*, **Jungseok Hong***, Junaed Sattar, “Using Monocular Vision and Human Body Priors for AUVs to Autonomously Approach Divers” Proceedings of ICRA 2022. Philadelphia, PA, USA. *The authors contributed equally to this work.
- [5] Jiacheng Yuan, **Jungseok Hong**, Junaed Sattar, Volkan Isler, “ROW-SLAM: Under-Canopy Cornfield Semantic SLAM” Proceedings of ICRA 2022. Philadelphia, PA, USA.
- [4] **Jungseok Hong**, Karin de Langis, Cole Wyeth, Chris Walaszek, Junaed Sattar, “Semantically-Aware Strategies for Stereo-Visual Robotic Obstacle Avoidance” Proceedings of ICRA 2021. Xi’an, China (Virtual).
- [3] Chelsey Edge, Sadman Sakib Enan, Michael Fulton, **Jungseok Hong***, Jiawei Mo, Kimberly Barthelemy, Hunter Bashaw, Berik Kallevig, Corey Knutson, Kevin Orpen, Junaed Sattar, “Design and Experiments with LoCO AUV: A Low Cost Open-Source Autonomous Underwater Vehicle” Proceedings of IROS 2020. Las Vegas, NV, USA (Virtual). *The authors in alphabetical order.
- [2] **Jungseok Hong**, Michael Fulton, Junaed Sattar, “A Generative Approach Towards Improved Robotic Detection of Marine Litter” Proceedings of ICRA 2020. Paris, France.
- [1] Michael Fulton*, **Jungseok Hong***, Junaed Sattar, “Robotic Detection of Marine Litter Using Deep Visual Detection Models” Proceedings of ICRA 2019. Montreal, QC, Canada. *The authors contributed equally to this work.

PEER-REVIEWED JOURNAL ARTICLES

- [4] **Jungseok Hong**, Michael Fulton, Kevin Orpen, Kimberly Barthelemy, Keara Berlin, Junaed Sattar, “A Quantitative Evaluation of Bathymetry-based Bayesian Localization Methods for Autonomous Underwater Robots” IEEE Journal of Oceanic Engineering (JOE), vol. 50, no. 2, pp. 985-1000, April 2025.
- [3] **Jungseok Hong**, Sadman Sakib Enan, Junaed Sattar, “Diver Identification Using Anthropometric Data Ratios for Underwater Multi-Human-Robot Collaboration” IEEE Robotics and Automation Letters (RA-L), vol. 9, no. 4, pp. 3514-3521, April 2024.
- [2] Md Jahidul Islam, **Jungseok Hong**, Junaed Sattar, “Person Following by Autonomous Robots: A Categorical Overview” The International Journal of Robotics Research (IJRR). 2019, 38(14), 1581–1618.
- [1] Brian Wenny, Dennis Helder, **Jungseok Hong**, Larry Leigh, Kurtis Thome, Dennis Reuter, “Pre- and Post-Launch Spatial Quality of the Landsat 8 Thermal Infrared Sensor” Remote Sensing. 2015, 7(2), 1962-1980.

PEER-REVIEWED WORKSHOP PAPERS

- [1] Chelsey Edge, Sadman Sakib Enan, Michael Fulton, **Jungseok Hong***, Junaed Sattar, “Power-On-and-Go Capabilities for a Low-Cost Modular Autonomous Underwater Vehicle” Robotics: Science and Systems (RSS) 2020 Workshop on Power On and Go Robots. Virtual RSS. *The authors in alphabetical order.

PREPRINTS

- [1] **Jungseok Hong**, Michael Fulton, Junaed Sattar, “Trashcan: A semantically-segmented dataset towards visual detection of marine debris”, Arxiv 2020.

Presentations

INVITED TALKS

- | | | |
|------|---|----------|
| [10] | MIT SPARK Lab, Department of Aeronautics and Astronautics, Host: Luca Carlone (Lorenzo Shaikewitz), Cambridge, MA | Aug 2025 |
| [9] | KAIST, Department of Mechanical Engineering, Host: Jinwhan Kim, Daejeon, Korea | Jul 2025 |
| [8] | IROS 2023 2nd Advanced Marine Robotics TC Workshop, Detroit, MI | Oct 2023 |
| [7] | MIT Computer Science & Artificial Intelligence Laboratory, Host: John Leonard, Cambridge, MA | Mar 2023 |
| [6] | 20th Annual Marine Robotics Workshop & Field Trials, Host: Greg Dudek, Holetown, Barbados | Feb 2023 |
| [5] | GRaDS at the University of Minnesota, Minneapolis, MN | Nov 2022 |
| [4] | Samsung AI Center New York, Host: Volkan Isler, New York, NY (Online) | Jan 2022 |
| [3] | 21st KOCSEA Technical Symposium, Las Vegas, NV | Nov 2021 |
| [2] | GRaDS at the University of Minnesota, Minneapolis, MN (Online) | Apr 2021 |
| [1] | VCAI Seminar at the University of Minnesota, Minneapolis, MN | Apr 2019 |

RESEARCH PRESENTATIONS

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| [10] | <i>Semantic Enhancement for Object SLAM with Heterogeneous Multimodal Large Language Model Agents</i> , Hangzhou, China | IROS 2025 |
| [9] | <i>IBURD: Image Blending for Underwater Robotic Detection</i> , Atlanta, GA | ICRA 2025 |
| [8] | <i>Opti-Acoustic Semantic SLAM with Unknown Objects in Underwater Environments</i> , London, UK | IROS 2024 |
| [7] | <i>Semantic Mapping with Confidence Scores through Metric Embeddings and Gaussian Process Classification</i> , London, UK | ICRA 2023 |
| [6] | <i>Using Monocular Vision and Human Body Priors for AUVs to Autonomously Approach Divers</i> , Philadelphia, PA | ICRA 2022 |
| [5] | <i>ROW-SLAM: Under-Canopy Cornfield Semantic SLAM</i> , Philadelphia, PA | ICRA 2022 |
| [4] | <i>Semantically-Aware Strategies for Stereo-Visual Robotic Obstacle Avoidance</i> , Xi'an, China (Virtual) | ICRA 2021 |
| [3] | <i>Design and Experiments with LoCO AUV: A Low Cost Open-Source Autonomous Underwater Vehicle</i> , Las Vegas, NV (Virtual) | IROS 2020 |
| [2] | <i>A Generative Approach Towards Improved Robotic Detection of Marine Litter</i> , Paris, France (Virtual) | ICRA 2020 |
| [1] | <i>Robotic Detection of Marine Litter Using Deep Visual Detection Models</i> , Montreal, QC, Canada | ICRA 2019 |

Student Mentoring

* students who co-authored the listed publications

GRADUATE STUDENTS

- | | |
|---|-----------|
| Paige Pfenninger, MIT-WHOI Joint Program and EECS, MIT | 2025-now |
| Elizabeth Gajski, MIT-WHOI Joint Program and MechE, MIT | 2025-now |
| Yi Yang, Division of Robotics, Perception and Learning, KTH | 2025-now |
| Daniel Yang, MIT-WHOI Joint Program and EECS, MIT | 2024-now |
| Eric Wang, Mechanical Engineering, MIT | 2024-now |
| Zachary Francis, Electrical Engineering and Computer Science, MIT | 2024-2025 |

JP Morrison, MIT-WHOI Joint Program and MechE, MIT, <i>now: Officer at the United States Navy</i>	2023-2025
Kurran Singh*, Mechanical Engineering, MIT, <i>now: Postdoctoral Researcher at TRI</i>	2023-2024
TJ Song, Naval Architecture and Marine Engineering, MIT, <i>now: Officer at the Royal Canadian Navy</i>	2023-2024
Sakshi Singh*, CS, University of Minnesota, <i>now: PhD Student at the University of Minnesota</i>	2022-2023

UNDERGRADUATE STUDENTS

Kota Uchida, MechE, MIT	2025-now
Wendy Cao, CS, MIT	2025
Nevena Stojkovic, CS, MIT	2025
Ben Withey, CS, University of Minnesota, <i>now: Research Associate at Inseer, Inc.</i>	2021
Kimberly Barthelemy*, AE, University of Minnesota, <i>now: Mechanical Engineer II at Collins Aerospace</i>	2021
Keara Berlin*, NSF REU Student, University of Minnesota, <i>now: AI/Data Science Engineer II at Medtronic</i>	2020
Kevin Orpen*, ME, University of Minnesota, <i>now: Design Engineer II at Collins Aerospace</i>	2019-2021
Chris Morse*, CS, University of Minnesota, <i>now: Software Engineer at Durandal</i>	2019-2020
Cole Wyeth*, CS, University of Minnesota, <i>now: PhD student at the University of Waterloo</i>	2019-2020
Julian Lagman, CS, University of Minnesota, <i>now: Software Engineer at Medtronic</i>	2018-2019

Teaching Experience

Teaching Assistant , Introduction to Machine Learning, CSCI5521 (Prof. Rui Kuang), <i>Univ. of Minnesota</i>	SP 2019
Teaching Assistant , Robotics I, CSCI5551 (Prof. Junaed Sattar), <i>Univ. of Minnesota</i>	FA 2018
Teaching Assistant , Linear Algebra, CSCI2033 (Prof. Yousef Saad), <i>Univ. of Minnesota</i>	SP 2018
Teaching Assistant , Computer Architecture, CSCI2021 (Lec. Chris Dovolis), <i>Univ. of Minnesota</i>	FA 2017
Teaching Assistant , Electrical Network, EEL3004 (Lec. Azza Fahim, Aman Behal), <i>Univ. of Central Florida</i>	SP 2017

Professional Developments and Services

ORGANIZATION OF WORKSHOPS

Co-organizer , AQ ² UASIM-V2: Advancing Quantitative and QUALitative SIMulators for marine applications, <i>under review</i>	2026
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PROFESSIONAL SERVICES

Session Chair , International Conference on Intelligent Robots and Systems (IROS)	2025
External Evaluator , Ph.D. Thesis Proposal, <i>Department of Aeronautics and Astronautics, MIT</i>	2025
Session Chair , IEEE International Conference on Robotics and Automation (ICRA)	2025
Reviewer , IEEE Transactions on Robotics (IEEE T-RO)	2024
Reviewer , IEEE Robotics and Automation Letters (IEEE RA-L)	2021-2025
Reviewer , Robotics: Science and Systems (RSS)	2024-2025
Reviewer , IEEE International Conference on Robotics and Automation (ICRA)	2019-2026
Reviewer , International Conference on Intelligent Robots and Systems (IROS)	2019-2025
Program Committee Member , Conference on Robots and Vision (CRV)	2021
Reviewer , IEEE Journal of Oceanic Engineering (IEEE JOE)	2021-2025
Reviewer , CRV	2019-2021
Student Representative , Computer Science Faculty Hiring Committee, <i>Univ. of Minnesota</i>	2020-2021

PROFESSIONAL MEMBERSHIPS

IEEE-Eta Kappa Nu (IEEE-HKN), the Honor Society of IEEE
 Tau Beta Pi (TBP), National Engineering Honor Society
 IEEE Robotics and Automation Society (RAS)

Awards, Fellowships, & Grants

IROS 2024 Workshop Best paper Award , Autonomous Robotic Systems in Aquaculture \$ 2,125	2024
ICRA 2023 RAS Travel Grant , IEEE Robotics and Automation Society \$ 1,300	2023
KOCSEA 2nd Place Award for Research Presentation , KOCSEA (Korean Computer Scientists and Engineers Association in America) \$ 500	2021
UMII MnDRIVE Graduate Fellowship , University of Minnesota MnDrive \$ 50,000	2019
Power System Protection Scholarship , Schweitzer Engineering Lab. (SEL) \$ 4,000	2015
Engineering Expo 2nd Place Award , South Dakota State University \$ 500	2015
BENNETT Fellowship , South Dakota State University \$ 3,000	2014
Dean's List , South Dakota State University	2013-2015
Dean's List , Sung Kyun Kwan University (SKKU)	2012
Samsung Full (4-year) Scholarship (Merit-based) , Sung Kyun Kwan University (SKKU) \$ 40,000	2007

Leadership Experience and Training

Participant and LEAPS Fellow , Leadership and Professional Strategies (LEAPS) Program (8.396/8.397), MIT	SP 2024
Research Mentoring Certificate , MIT Professional Development Certificate, MIT	IAP 2024
Vice President , Computer Science Graduate Student Association (CSGSA), Univ. of Minnesota	2019-2020
Vice President , Minnesota Korean Graduate Student Association (MKGSA), Univ. of Minnesota	2018-2020
Fundraising Chair , Habitat for Humanity, Univ. of Central Florida	2015-2016
Vice President , IEEE Eta Kappa Nu (HKN), the honor society of IEEE, South Dakota State University	2014-2015
President , Korean Student Association(KSA), South Dakota State University	2013-2015

Scientific Communications

OUTREACH

Panelist , "How to Thrive as a PhD Student" in Intro to Research in CS (CSCI 8001), Instructor: Prof. Lana Yarosh, Univ. of Minnesota	Sep 2022
Graduate Student Panelist , Graduate School Information Sessions for international students, Univ. of Minnesota	Mar 2020
MnDrive Scholar , STEM Camp for K-12 students, Univ. of Minnesota	2019
Student Representative , Organizing and operating prospective students visiting day, Univ. of Minnesota	Mar 2019
Student Representative , Presenting CSE program and research at the CSE career fair, Univ. of Minnesota	Sep 2018
MnDrive Scholar , STEM Camp for K-12 students, Univ. of Minnesota	2018
MnDrive Scholar , Introducing Tech Camp (STEM Camp), Minnesota State Fair	Aug 2018
Student Representative , Organizing and operating prospective students visiting day, Univ. of Minnesota	Mar 2018

MEDIA COVERAGE

Featured News , CSpotlight: Cleaning Up the Ocean One Robot at a Time, Department of Computer Science and Engineering, University of Minnesota	Feb 2023
Featured News , Low-cost Underwater Robot (LoCO), KSTP-TV (an ABC-affiliated station)	Feb 2020