

Jungseok Hong, Ph.D.

POSTDOCTORAL ASSOCIATE

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

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Employment

Postdoctoral Associate , MIT CSAIL, Advisor: John J. Leonard, <i>Cambridge, MA, USA</i>	Sep 2023 - now
Research Intern , Samsung AI Center New York, Advisor: Volkan Isler, <i>New York, NY, USA</i>	Feb 2022 - Sep 2022
Research Intern , Sentera, Advisor: Dimitris Zermas, <i>Minneapolis, MN, USA</i>	May 2020 - Aug 2020

Education

Ph.D. Computer Science and Engineering , University of Minnesota, <i>Minneapolis, MN, USA</i> Advisor: Junaed Sattar, Committee: Nikolaos Papanikolopoulos, Catherine Zhao, Maziar Hemati Thesis: "Toward Robotic Autonomy in Data-Scarce and Visually Challenging Environments"	2017 - 2023
M.Sc. Electrical Engineering , University of Central Florida, <i>Orlando, FL, USA</i> Advisor: Wei Sun, "A Multiagent Q-learning-based Restoration Algorithm for Resilient Distribution System Operation"	2015 - 2017
B.Sc. Electrical Engineering (Summa Cum Laude), Minor in Mathematics , South Dakota State University, <i>Brookings, SD, USA</i> Advisor: Wei Sun, "Senior Design: Design of Relay-based Protection Scheme for Wind Farm Generator Installations" Obtained Fundamentals of Engineering Certificate (Engineer In Training)	2013 - 2015
B.Sc. Electrical Engineering (Summa Cum Laude) , Sung Kyun Kwan University, <i>Seoul, Korea</i> Awarded Dual Degree with South Dakota State University *Military service as a Staff Sergeant in the Republic of Korea Air Force (2008-2010)	2007 - 2015

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
Dean's List , South Dakota State University	2015
BENNETT Fellowship , South Dakota State University \$ 3,000	2014
Dean's List , South Dakota State University	2014
Dean's List , South Dakota State University	2013
Dean's List , Sung Kyun Kwan University (SKKU)	2012
Samsung Full (4-year) Scholarship (Merit-based) , Sung Kyun Kwan University (SKKU) \$ 40,000	2007

Publications

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 the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2024. Abu Dhabi, UAE.
- [8] **Jungseok Hong**, Suveer Garg, Volkan Isler, “Semantic Mapping with Confidence Scores through Metric Embeddings and Gaussian Process Classification” Proceedings of the IEEE International Conference on Robotics and Automation (ICRA) 2023. London, United Kindom.
- [7] Jinwook Huh, **Jungseok Hong**, Suveer Garg, Hyun Soo Park, Volkan Isler, “Self-supervised Wide Baseline Visual Servoing via 3D Equivariance” Proceedings of the International Conference on Intelligent Robots and Systems (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 the IEEE International Conference on Robotics and Automation (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 the IEEE International Conference on Robotics and Automation (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 the IEEE International Conference on Robotics and Automation (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 the International Conference on Intelligent Robots and Systems (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 the IEEE International Conference on Robotics and Automation (ICRA) 2020. Paris, France.
- [1] Michael Fulton*, **Jungseok Hong***, Junaed Sattar, “Robotic Detection of Marine Litter Using Deep Visual Detection Models” Proceedings of the IEEE International Conference on Robotics and Automation (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.

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 40,000+ times as of May 9th 2024) [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 11,000+ times as of May 9th 2024) [url: <https://conservancy.umn.edu/handle/11299/214366>]

PREPRINTS

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

Presentations

INVITED TALKS

- | | |
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| [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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| [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 |

Teaching Experience

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| 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 |

Student Supervision

* *students who co-authored the listed publications*

GRADUATE STUDENTS

- | | |
|--|----------|
| Eric Wang, Mechanical Engineering, MIT | 2024-now |
| JP Morrison, MIT-WHOI Joint Program and MechE, MIT | 2023-now |

Kurran Singh*, Mechanical Engineering, MIT	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

Wendy Cao, CS, MIT	2025-now
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

Professional Developments and Services

PROFESSIONAL SERVICES

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)	2019-2025
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
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)

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), <i>Univ. of Minnesota</i>	2019-2020
Vice President , Minnesota Korean Graduate Student Association (MKGSA), <i>Univ. of Minnesota</i>	2018-2020
Fundraising Chair , Habitat for Humanity, <i>Univ. of Central Florida</i>	2015-2016
Vice President , IEEE Eta Kappa Nu (HKN), the honor society of IEEE, <i>South Dakota State University</i>	2014-2015
President , Korean Student Association(KSA), <i>South Dakota State University</i>	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, <i>Univ. of Minnesota</i>	Sep 2022
Graduate Student Panelist , Graduate School Information Sessions for international students, <i>Univ. of Minnesota</i>	Mar 2020
MnDrive Scholar , STEM Camp for K-12 students, <i>Univ. of Minnesota</i>	2019

Student Representative , Organizing and operating prospective students visiting day, <i>Univ. of Minnesota</i>	Mar 2019
Student Representative , Presenting CSE program and research at the CSE career fair, <i>Univ. of Minnesota</i>	Sep 2018
MnDrive Scholar , STEM Camp for K-12 students, <i>Univ. of Minnesota</i>	2018
MnDrive Scholar , Introducing Tech Camp (STEM Camp), <i>Minnesota State Fair</i>	Aug 2018
Student Representative , Organizing and operating prospective students visiting day, <i>Univ. of Minnesota</i>	Mar 2018

MEDIA COVERAGE

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