Jungseok Hong

PhD Candidate · Robotics

Department of Computer Science and Engineering, University of Minnesota
129 Shepherd Laboratories, 100 Union St SE, Minneapolis, MN 55155

jungseok@umn.edu | www.jungseokhong.com

Education

University of Minnesota — *Minneapolis, MN, USA*

Ph.D. Computer Science and Engineering (Passed Ph.D. Defense, Expected July 2023) — *Sep 2017 - present*

- Advisor: Junaed Sattar
- Committee: Junaed Sattar, Nikolaos Papanikolopoulos, Catherine Zhao, Maziar Hemati
- Thesis: Toward Robotic Autonomy in Data-Scarce and Visually Challenging Environments

University of Central Florida — *Orlando, FL, USA*

M.Sc. Electrical Engineering — *Sep 2015 - August 2017*

- Advisor: Wei Sun
- Committee: Wei Sun, Qipeng Zheng, Qun Zhou
- Thesis: A Multiagent Q-learning-based Restoration Algorithm for Resilient Distribution System Operation

South Dakota State University — *Brookings, SD, USA*

B.Sc. Electrical Engineering (*Summa Cum Laude*), Minor in Mathematics — *Jan 2013 - May 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)

Sung Kyun Kwan University (SKKU) — *Seoul, Korea*

B.Sc. Electrical Engineering — *Mar 2007 - Aug 2015*

- Awarded Samsung Full Scholarship based on an excellent Korean SAT score and fully funded
- Obtained Dual Degree with South Dakota State University

Professional Experience

2019-2023	**Graduate Research Assistant**, University of Minnesota, Advisor: Junaed Sattar
2022-2022	**Research Intern (7-month)**, Samsung AI Center New York (New York, NY), Advisor: Volkan Isler
2020-2020	**Research Intern (Summer)**, Sentera (Minneapolis, MN), Advisor: Dimitris Zermas
2017-2019	**Graduate Teaching Assistant**, University of Minnesota
2017-2017	**Graduate Teaching Assistant**, University of Central Florida
2015-2017	**Graduate Research Assistant**, University of Central Florida, Advisor: Wei Sun
2013-2015	**Undergraduate Research Assistant**, South Dakota State University, Advisors: Wei Sun, Dennis Helder, Wei Wang

Publications

Peer-reviewed Conference Publications

[C10] **Jungseok Hong**, Sakshi Singh, Junaed Sattar, "IBURD: Image Blending for Underwater Robotic Detection" Under Review.

[C9] **Jungseok Hong**, Sadman Sakib Enan, Christopher Morse, Junaed Sattar, "Visual Diver Face Recognition for Underwater Human-Robot Interaction" Unber Review.

[C8] **Jungseok Hong**, Suveer Garg, Volkan Isler, "Semantic Mapping with Confidence Scores through Metric Embeddings and Gaussian Process Classification" Accepted for publication in the IEEE International Conference on Robotics and Automation (ICRA) 2023.

[C7] 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. In Press. Kyoto, Japan.

[C6] 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. In Press. Philadelphia, PA, USA. *The authors contributed equally to this work.

[C5] 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. In Press. Philadelphia, PA, USA.

[C4] **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. In Press. Xi'an, China (Virtual).

[C3] 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. In Press. Las Vegas, NV, USA (Virtual). *The authors in alphabetical order.

[C2] **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. In Press. Paris, France.

[C1] 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. In Press. Montreal, QC, Canada. *The authors contributed equally to this work.

Journal Articles

[J3] **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" Under Review

[J2] 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.

[J1] 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

[W1] 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.

Released Datasets

[D2] **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 35,813 times as of May 18th 2023) [url: `https://conservancy.umn.edu/handle/11299/214865`]

[D1] 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 9,148 times as of May 18th 2023) [url: `https://conservancy.umn.edu/handle/11299/214366`]

Preprints

[P1] **Jungseok Hong**, Michael Fulton, Junaed Sattar, "Trashcan: A semantically-segmented dataset towards visual detection of marine debris", Arxiv 2020.

Awards, Fellowships, & Grants

2023	**ICRA 2023 RAS Travel Grant**, IEEE Robotics and Automation Society	*$ 1,300*
2021	**KOCSEA 2nd Place Award for Research Presentation**, KOCSEA (Korean Computer Scientists and Engineers Association in America)	*$ 500*

2019	**UMII MnDRIVE Graduate Fellowship**, University of Minnesota MnDrive	*$ 50,000*
2015	**Power System Protection Scholarship**, Schweitzer Engineering Lab. (SEL)	*$ 4,000*
	Engineering Expo 2nd Place Award, South Dakota State University	*$ 500*
	Dean's List, South Dakota State University	
2014	**BENNETT Fellowship**, South Dakota State University	*$ 3,000*
	Dean's List, South Dakota State University	
2013	**Dean's List**, South Dakota State University	
2012	**Dean's List**, Sung Kyun Kwan University (SKKU)	
2007	**Samsung Full (4-year) Scholarship**, Sung Kyun Kwan University (SKKU)	*$ 40,000*

Presentations

Invited Talks

March 2023. *Toward robotic autonomy in data-scarce and visually challenging environments*. Invited talk: MIT Computer Science & Artificial Intelligence Laboratory, Host: John Leonard Cambridge, MA.

February 2023. *Toward robotic perception in data-scarce and visually challenging environments*. Invited talk: 20th Annual Marine Robotics Workshop & Field Trials, Host: Greg Dudek Holetown, Barbados.

November 2022. *Toward robotic perception and its applications in a data-scarce and visually challenging environment*. Invited talk: GRaDS at the University of Minnesota, Minneapolis, MN.

Januaray 2022. *Robust Object Detection, Localization, and Exploration for Autonomous Robots in Unstructured Environments*. Invited talk: Samsung AI Center New York, Host: Volkan Isler, New York, NY (Online).

November 2021. *Semantically-Aware Strategies for Stereo-Visual Robotic Obstacle Avoidance*. Invited talk: the 21st KOCSEA Technical Symposium, Las Vegas, NV.

April 2021. *Semantically-Aware Strategies for Stereo-Visual Robotic Obstacle Avoidance*. Invited talk: GRaDS at the University of Minnesota, Minneapolis, MN (Online).

April 2019. *Towards the Detection and Localization of Underwater Trash by Autonomous Robotic Platforms*. Invited talk: VCAI Seminar at the University of Minnesota, Minneapolis, MN.

Research Presentations

"Using Monocular Vision and Human Body Priors for AUVs to Autonomously Approach Divers" Poster Presentation: ICRA 2022, Philadelphia, PA.

"ROW-SLAM: Under-Canopy Cornfield Semantic SLAM" Poster Presentation: ICRA 2022, Philadelphia, PA.

"Semantically-Aware Strategies for Stereo-Visual Robotic Obstacle Avoidance" Poster Presentation: ICRA 2021, Xi'an, China (Virtual).

"Design and Experiments with LoCO AUV: A Low Cost Open-Source Autonomous Underwater Vehicle" Poster Presentation: IROS 2020, Las Vegas, NV (Virtual).

"A Generative Approach Towards Improved Robotic Detection of Marine Litte" Poster Presentation: ICRA 2020, Paris, France (Virtual).

"Robotic Detection of Marine Litter Using Deep Visual Detection Models" Poster Presentation: ICRA 2019, Montreal, QC, Canada.

Teaching Experience

Spring 2019	**Introduction to Machine Learning, CSCI5521**, Teaching Assistant to Prof. Rui Kuang	*Univ. of Minnesota*
Fall 2018	**Robotics I, CSCI5551**, Teaching Assistant to Prof. Junaed Sattar	*Univ. of Minnesota*
Spring 2018	**Linear Algebra, CSCI2033**, Teaching Assistant to Prof. Yousef Saad	*Univ. of Minnesota*
Fall 2017	**Computer Architecture, CSCI2021**, Teaching Assistant to Lec. Chris Dovolis	*Univ. of Minnesota*
Spring 2017	**Electrical Network, EEL3004**, Teaching Assistant to Lec. Azza Fahim, Aman Behal	*Univ. of Central Florida*

Mentoring

** undergraduates who co-authored the listed publications*

2021-2021	**Ben Withey**, CS Undergrad, University of Minnesota	
2019-2021	**Kevin Orpen***, ME Undergrad, University of Minnesota	*Associate Design Engineer at Collins Aerospace*
2019-2020	**Chris Morse***, CS Undergrad, University of Minnesota	*PhD Student at the University of Virginia*
2019-2020	**Cole Wyeth***, CS Undergrad, University of Minnesota	
2018-2019	**Julian Lagman**, CS Undergrad, University of Minnesota	*Software Engineer at Medtronic*

Outreach & Professional Development, Service

Professional Services

2019-2023	**ICRA**, Reviewer	
2019-2023	**IROS**, Reviewer	
2021	**Conference on Robots and Vision (CRV)**, Program Committee Member	
2021	**IEEE Journal of Oceanic Engineering (IEEE JOE)**, Reviewer	
2019-2021	**CRV**, Reviewer	
2020-2021	**Computer Science Faculty Hiring Committee**, Student Representative	*Univ. of Minnesota*

Outreach

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

Leadership Activities

2019-2020	**Computer Science Graduate Student Association (CSGSA)**, Vice President	*Univ. of Minnesota*
2018-2020	**Minnesota Korean Graduate Student Association (MKGSA)**, Vice President	*Univ. of Minnesota*
2015-2016	**Habitat for Humanity**, Fundraising Chair	*Univ. of Central Florida*
2014-2015	**IEEE Eta Kappa Nu (HKN), the honor society of IEEE**, Vice President	*South Dakota State University*
2013-2015	**Korean Student Association(KSA)**, President	*South Dakota State University*

Professional Memberships

- IEEE HKN
- Tau Beta Pi (TBP), national engineering honor society
- IEEE

Media Coverage

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