

Wonse Jo

Michigan Autonomous Vehicle Research Intergroup Collaboration (MAVRIC) Lab
 Robotics Department in the College of Engineering
 University of Michigan, Ann Arbor, MI USA, 48105

CONTACT INFORMATION

MAVRIC Lab, FRB #3290
 Robotics department in College of Engineering
 University of Michigan, Ann Arbor, MI USA

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RESEARCH INTERESTS

Human-Robot Interaction, Multi-human Multi-robot teams, Affective Robotics & Computing, Robot Design & Control, Embedded Systems, Field Robotics, and Multi-robot System.

EDUCATION

Post-Doc in Robotics *Mar. 2023 - Present*
 University of Michigan, Ann Arbor, MI USA
 - *Advisors:* Prof. Dawn Tilbury and Prof. Lionel Robert

Doctor of Philosophy in Computer and Information Technology *Dec. 2022*
 Purdue University, West Lafayette, IN USA
 - *Advisor:* Dr. Byung-Cheol Min

Master of Engineering in Electronics and Radio Engineering *Feb. 2015*
 Kyung Hee University, Yongin-si, Gyeonggi-do, South Korea
 - *Advisor:* Dr. Donghan Kim

Bachelor of Engineering in Robotics Engineering *Feb. 2013*
 Hoseo University, Asan-si, Chungcheongnam-do, South Korea

PROFESSIONAL EXPERIENCE

Postdoctoral Researcher in Robotics Department *Mar. 2023 - Present*
 MARVIC Lab, University of Michigan, Ann Arbor, MI USA
 - Development of adaptive tour-guide robot system based on visitor's engagement
 - Writing grant proposals related to human-robot interaction
 - Mentoring graduate and undergraduate students

Graduate Research Assistant *Aug. 2017 – Dec. 2022*
 SMART Lab, Polytechnic Institute, Purdue University, West Lafayette, IN USA
 - Development of adaptive human-multi robot systems to enable human operators to adapt to robot system changes and robots to adapt to human cognitive and emotional states, funded by National Science Foundation (#IIS-1846221)
 - Development of a low-cost, small, and 3D printed Unmanned Surface Vehicle (USV) platform for real-time water quality monitoring and of a sediment sampling testbed to evaluate sampling methods for robotic sediment sampling systems, funded by National Science Foundation (#CNS-1439717) and by Universidad Nacional de San Agustin

- Development of a hovercraft type USV for harmful algae removal, funded by Purdue Research Foundation as Fellowship

Research Intern

May 2018 – June 2018

Marine Robotics Research Department,

Korea Research Institute of Ships and Ocean Engineering (KRISO) Institute, South Korea

- Development of thrust control systems for Autonomous Surface Vehicle (ASV)
- Design of graphical user interface using C# for monitoring the thrust status

Software & Hardware Developer

Nov. 2016 – Jun. 2017

Technology Research Center, KMF Corporation, South Korea

- Development of educational robot kits for STEM education in collaboration with the Department of robotics engineering at Hoseo University, South Korea
- Prototyping of underactuated motor system

Postmaster Research Associate

Jun. 2015 – May 2016

Human and Robot Interaction (HRI) Lab, Kyung Hee University, South Korea

- Design of a sound auditory feedback system for the violin-playing robot

Graduate Research Assistant

Mar. 2013 – Feb. 2015

Department of Electronics and Radio Engineering, Kyung Hee University, South Korea

- Development of the mobile robot using smart floor system inserted Passive RFID, the dust detection sensor for vacuum cleaning robots, and the violin playing robot

Undergraduate Teaching Assistant

Mar. 2008 – Feb. 2012

Department of Robotics Engineering, Hoseo University, South Korea

- Course: Robotics design and practices
- Content: 2D and 3D modeling for robot hardware.

PUBLICATIONS**Peer-Reviewed Journals**

1. **Wonse Jo**, Go-Eum Cha, Daniel Foti, and Byung-Cheol Min, "SMART-TeleLoad: A New Graphic User Interface to Generate Affective Loads for Teleoperation," *SoftwareX* (Accepted).
2. Ruiqi Wang*, **Wonse Jo***, Dezhong Zhao, Weizheng Wang, Baijian Yang, Guohua Chen, and Byung-Cheol Min (* equal contribution), "Husformer: A Multi-Modal Transformer for Multi-Modal Human State Recognition", *IEEE Transactions on Cognitive and Developmental Systems* (Early Access).
3. Ahreum Lee, **Wonse Jo**, Shyam Sundar Kannan, and Byung-Cheol Min, "Investigating the Effect of Deictic Movements of a Multi-robot," *International Journal of Human-Computer Interaction (IJHCI)*, 37(3), pp. 197-210, 2021.
4. Jun Han Bae, **Wonse Jo**, Jee Hwan Park, Richard M. Voyles, Sara K. McMillan and Byung-Cheol Min, "Evaluation of Sampling Methods for Robotic Sediment Sampling Systems," *IEEE Journal of Oceanic Engineering*, 46(2), pp. 542-554, April 2021.
5. Tamzidul Mina, Shyam Sundar Kannan, **Wonse Jo**, and Byung-Cheol Min, "Adaptive Workload Allocation for Multi-human Multi-robot Teams for Independent and Homogeneous Tasks," *IEEE Access*, 8, pp. 152697-152712, 2020.
6. **Wonse Jo**, Yuta Hoashi, Lizbeth Leonor Paredes Aguilar, Mauricio Postigo-Malaga, José M. Garcia-Bravo, and Byung-Cheol Min "A Low-cost Small USV Platform for Water Quality Monitoring," *International Open Access Journal of HardwareX*, 6, e00076, October 2019.

7. **Wonse Jo**, Jargalbaatar Yura, and Donghan Kim, "Sound Improvement of Violin Playing Robot Applying Auditory Feedback," *Journal of Electrical Engineering & Technology*, 12(6), pp. 2378-2387, 2017.
8. **Wonse Jo**, Kyeong-min Cheon, and Keun-ho Rew, "Motion Sensing System for Automation of Neuropsychological Test," *The Journal of Sensor Science and Technology*, 26(2), pp. 128-134, 2017.
9. **Wonse Jo**, Bumjoo Lee, and Donghan Kim, "Development of auditory feedback system for violin playing robot," *International Journal of Precision Engineering and Manufacturing*, 17(6), pp. 717-724, 2017.
10. Hyeonjun Park, **Wonse Jo**, Kyeongmin Choi, and Donghan Kim, "A Study about Robotic Hand and Finger for Violin Playing Robot," *International Journal of Applied Engineering Research*, 10(11), pp. 27553-27557, 2016.
11. Hyeonjun Park, **Wonse Jo**, Kyeongmin Choi, Hwonjae Jung, Jargalbaatar Yura, Soongeul Lee, Bum-Joo Lee, and Dong-Han Kim, "Development of Robotic Finger Using 3-Axis Load Cell for Violin Playing Robot," *Mechanical Engineering*, pp. 22-26, 2015.
12. Sangyup Lee, Choong-Yong Lee, **Wonse Jo**, Sang Yep Nam, and Dong-Han Kim, "Passive RFID system for Efficient Area Coverage Algorithm," *Journal of The Institute of Electronics and Information Engineers*, 51(2), pp. 460-466, 2014.
13. **Wonse Jo**, Donghan Kim, and Keun-Ho Rew, "Robot Arm Recognizing, Drawing Various Line Thicknesses," *Journal of Institute of Control, Robotics and Systems*, 19(12), pp. 1105-1110, 2013.

Peer-Reviewed Conferences and Workshops

1. Yanran Lin, **Wonse Jo**, Lionel P. Robert Jr., and Dawn Tilbury, "Toward Personalized Tour-Guide Robot: Adaptive Content Planner based on Visitor's Engagement", *2024 ACM/IEEE International Conference on Human-Robot Interaction - Late-breaking Report (LBR)*, March 11-14, 2024, Boulder, Colorado.
2. Arsha Ali, Rohit Banerjee, **Wonse Jo**, Lionel P. Robert Jr., and Dawn Tilbury, "Spot Report: Real-time Pygame Based Secondary Task For Use In Human-Robot Interaction User Experiments", *2024 ACM/IEEE International Conference on Human-Robot Interaction - Late-breaking Report (LBR)*, March 11-14, 2024, Boulder, Colorado.
3. Xin Ye, **Wonse Jo**, Arsha Ali, Samia Cornelius Bhatti, Conner Esterwood, Hana Andargie Kassie, and Lionel P. Robert Jr., "Autonomy Acceptance Model (AAM): The Role of Autonomy and Risk in Security Robot Acceptance," *the 19th Annual ACM/IEEE International Conference on Human Robot Interaction (HRI)*, March 11-14, 2024, Boulder, Colorado.
4. Go-Eum Cha, **Wonse Jo**, and Byung-Cheol Min, "Implications of Personality on Cognitive Workload, Affect, and Task Performance in Robot Remote Control", *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2023)*, Detroit, MI, USA, October 1-5, 2023.
5. Tamzidul Mina, **Wonse Jo**, Shyam Sundar Kannan, and Byung-Cheol Min, "Beacon-based Distributed Structure Formation in Multi-agent Systems", *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2023)*, Detroit, MI, USA, October 1-5, 2023.
6. **Wonse Jo**, Robert Wilson, Jaeun Kim, Steve McGuire, and Byung-Cheol Min, "Toward a Wearable Biosensor Ecosystem on ROS 2 for Real-time Human-Robot Interaction Systems," *2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS): Workshop on HMRS 2021: Cognitive and Social Aspects of Human Multi-Robot Interaction*, Prague, Czech Republic, Sep 27 - Oct 1, 2021. [**Excellent Paper Award**]
7. **Wonse Jo**, Jaeun Kim, and Byung-Cheol Min, "ROS2 Open-Source Swarm Robot Platform: SMARTmBot," *2021 International Conference on Robotics and Automation (ICRA): Workshop on Robot Swarms in the Real World: From Design to Deployment - Live Demonstration*, Xi'an,

- China, May 30 - June 5, 2021.
8. **Wonse Jo**, Shyam Sundar Kannan, Go-Eum Cha, Ahreum Lee, and Byung-Cheol Min, "ROSBAG-based Multimodal Affective Dataset for Emotional and Cognitive States," *2020 IEEE International Conference on Systems, Man and Cybernetics (SMC)*, Toronto, Canada, 11-14 Oct., 2020.
 9. Shyam Sundar Kannan, **Wonse Jo**, Ramvijas Parasuraman, and Byung-Cheol Min, "Material Mapping in Unknown Environments using Tapping Sound," *2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Las Vegas, NV, USA, Oct. 25-29, 2020.
 10. **Wonse Jo**, Jee Hwan Park, Sangjun Lee, Ahreum Lee, and Byung-Cheol Min, "Design of a Human Multi-Robot Interaction Medium of Cognitive Perception," *2019 ACM/IEEE International Conference on Human-Robot Interaction 2019 - Late-breaking Report (LBR)*, Mar. 2019.
 11. **Wonse Jo**, Jee Hwan Park, Yuta Hoashi, and Byung-Cheol Min, "Development of an Unmanned Surface Vehicle for Harmful Algae Removal," *2019 MTS/IEEE OCEANS*, Seattle, WA, USA, Oct. 27-31, 2019. **[Finalist in Student Poster Competition]**
 12. **Wonse Jo**, Hyeonjun Park, Bumjoo Lee, and Donghan Kim, "A study on improving sound quality of violin playing robot," *The 6th International Conference on Automation, Robotics and Applications*, 2015.
 13. **Wonse Jo**, Bum-Joo Lee, and Donghan Kim, "A study on Performance Evaluation Method of Violin-Playing Robot using auditory feedback," *2014 The Institute of Electronics and Information Engineers Symposium*, 2014.
 14. Donghoe Kim, **Wonse Jo**, Bumjoo Lee, Jinung An, and Donghan Kim, "Improvement of Dust Detection System using Infra-red Sensors," *2014 Robot Intelligence Technology and Applications (RiTA)*, 2014.
 15. **Wonse Jo**, Donghoe Kim, Bumjoo Lee, and Donghan Kim, "A Study on Violin-Playing Robot by Real-Time Auditory Feedback," *2014 29th Institute of Control, Robotics and Systems (ICROS) Annual Conference*, pp. 652-653, 2014.
 16. Sangyup Lee, Choong-Yong Lee, **Wonse Jo**, and Dong-Han Kim, "An efficient area coverage algorithm using passive RFID system," *Sensors Applications Symposium (SAS), 2014 IEEE*, pp. 366-371, 2014.
 17. Jae-Seok Yoon, Byung-Cheol Min, Seong-Og Shin, **Wonse Jo**, and Dong-Han Kim, "GA-Based Optimal Waypoint Design for Improved Path Following of Mobile Robot," *Robot Intelligence Technology and Applications 2*, pp. 127-136, 2014.

Under Review

1. **Wonse Jo**, Ruiqi Wang, Baijian Yang, Dan Foti, Mo Rastgaar, and Byung-Cheol Min, "Affective Workload Allocation for Multi-human Multirobot Teams", *IEEE Transactions on Human-Machine System* (minor revision).
2. **Wonse Jo***, Ruiqi Wang*, Su Sun, Revanth Senthilkumaran, Daniel Foti, and Byung-Cheol Min (* equal contribution), "MOCAS: A Multimodal Dataset for Objective Cognitive Workload Assessment on Simultaneous Tasks", *IEEE Transactions on Affective Computing* (major revision).
3. Tamzidul Mina, Shyam Sundar Kannan, **Wonse Jo**, Shaocheng Luo, Galen B. King, and Byung-Cheol Min, "Distributed Multi-robot Arbitrary Object Transportation with Pushing Surface Identification and Model-based Pushing Effort Regulation", *IEEE Transactions on Systems, Man and Cybernetics: Systems*.

Posters

1. **Wonse Jo**, Ruiqi Wang, Revanth Krishna Senthilkumaran, and Byung-Cheol Min, "A New Stimulus Tool to Generate and Measure Visual Perceptual and Cognitive Loads for Teleoperated Human-Robot Teams," *2022 Spring Polytechnic Research Impact Area Student Poster Symposium*, Purdue

- University, May. 2022. [**Second Runner Up**]
2. Revanth Krishna Senthilkumaran, **Wonse Jo**, Ruiqi Wang, and Byung-Cheol Min, "A GUI for Measuring Cognitive Workload Stimulus in Human-robot Interaction," *Spring 2022 Purdue Undergraduate Research*, Purdue University, April. 2022. [**3rd Awards - Interdisciplinary section**]
 3. Jae-eun Kim, **Wonse Jo**, Ahreum Lee, and Byung-Cheol Min, "Development of an Open-source Mobile Robot Platform for Multi-robot Systems," *2021 Purdue Spring Undergraduate Research Expo*, Purdue University, Apr. 2021. [**Academic Unit Awards - Research Talks**]
 4. **Wonse Jo**, Tamzidul Mina, Shyam Sundar Kannan, and Dr. Byung-Cheol Min, "Affective Adaptive Control System for Multi-human Multi-robot Teams," *2020 Fall the Realizing the Digital Enterprise (RDE) Mini-Talk Session*, Purdue University, Nov. 2020. [**Best Presentation Award**]
 5. Go-Eum Cha, **Wonse Jo**, and Byung-Cheol Min, "Human Cognitive Load Prediction with Behavioral Cues for Human-Machine Interaction," *2020 Fall the Realizing the Digital Enterprise (RDE) Mini-Talk Session*, Purdue University, Nov. 2020. [**Best Presentation Award**]
 6. Jae-eun Kim, **Wonse Jo**, and Byung-Cheol Min, "Development of an Open-source Mobile Robot Platform for Multi-robot systems," *2020 Fall the Realizing the Digital Enterprise (RDE) Mini-Talk Session*, Purdue University, Nov. 2020.
 7. Pou hei Chan, **Wonse Jo**, Chad T. Jafvert, Mauricio Postigo-Malaga, and Byung-Cheol Min, "Vertically Symmetrical Unmanned Surface Vessel (VSUSV) for Bathymetric and Water Quality Surveys of Surface Waters," *2020 the Realizing the Digital Enterprise Poster Session*, Purdue University, Nov. 2020.
 8. **Wonse Jo**, Pou hei Chan, Chad T. Jafvert, Mauricio Postigo-Malaga, and Byung-Cheol Min, "Development of a Vertically Symmetrical Unmanned Surface Vessel (VSUSV) for Bathymetric and Water Quality Surveys of Surface Waters," *2020 the 7th Annual C4E Environmental Community Mixer*, Purdue University, Oct. 2020.
 9. **Wonse Jo**, Jee Hwan Park, Yuta Hoashi, and Byung-Cheol Min, "Development of an Unmanned Surface Vehicle for Harmful Algae Removal," *2019 MTS/IEEE OCEANS*, Seattle, WA, USA, Oct. 27-31, 2019. [**Finalist in Student Poster Competition**]
 10. Jae-eun Kim, **Wonse Jo**, Ahreum Lee, and Byung-Cheol Min, "A Study on the Impact of Audio-visual Feedback in Human-Swarm Interaction," *2019 Purdue Fall Undergraduate Research Expo*, Purdue University, Nov. 2019.
 11. Walter Kruger, **Wonse Jo**, Manoj Raj Penmetcha, and Byung-Cheol Min, "Development of an Adaptive Human-Robot Teleoperation Platform," *2019 Purdue Fall Undergraduate Research Expo*, Purdue University, November 2019.
 12. Yuta Hoashi, **Wonse Jo**, and Byung-Cheol Min, "Development of Low-Cost, Simplified Humanoid Head," *2019 Purdue Fall Undergraduate Research Expo*, Purdue University, November 2019. [**Thematic (Innovative Technology, Entrepreneurship, Design) Award**]
 13. **Wonse Jo**, Tamzidul Mina, Jee Hwan Park, Ahreum Lee, and Byung-Cheol Min, "Human-swarm Robot Interaction Platform for STEM Education," *2019 Next Generation Scholars Event*, Purdue University, November 2019.
 14. Manoj Penmetcha, **Wonse Jo**, Walter Kruger, and Byung-Cheol Min, "You Cannot Hide Your Emotions from Us!," *2019 Next Generation Scholars Event*, Purdue University, November 2019.
 15. **Wonse Jo**, Jee Hwan Park, Yuta Hoashi, and Byung-Cheol Min, "Development of environmental cleanup unmanned surface vehicle," *2019 the 6th Annual C4E Environmental Community Mixer*, Purdue University, October 2019.
 16. Yogang Singh, Jun Han Bae, Shyam Sundar Kannan, Shaocheng Luo, **Wonse Jo**, Yuta Haoshi, José Garcia, Brittany Newell, Mauricio Postigo, Sara McMillan, Richard Voyles, Lisbeth Leonor Paredes Aguilar, Godofredo Pena, Edgar Gonzales Zenteno, and Byung-Cheol Min, "Design and Development of Unmanned Robotic Water Quality Monitoring and Sediment Sampling Systems,"

- 2019 Center for the Environment (C4E) Mixer*, Purdue University, Oct. 2019.
17. Jun Han Bae, Yogang Singh, **Wonse Jo**, Yuta Hoashi, Jose Garcia, Brittany Newell, Mauricio Postigo, Sara McMillan, Richard Voyles, Lisabeth Leonor Pardes Aguilar, Godofredo Pena, Edgar Gonzales Zenteno, and Byung-Cheol Min, “Robotic Water Quality Monitoring and Sediment Sampling: A Pilot Study,” *2019 NEXUS Workshop Poster Presentation*, Purdue University, July 2019.
 18. **Wonse Jo**, Jee Hwan Park, Yuta Hoashi, and Byung-Cheol Min, “Development of Low-cost Prototype USVs for Water Research,” *2018 the Realizing the Digital Enterprise poster session*, Purdue University, Dec. 2018. [**Best Presentation Award**]
 19. Shyam Sundar Kannan, **Wonse Jo**, and Byung-Cheol Min, “Development of tapping multi robot,” *2018 the Dawn or Doom 2018 emerging technology conference*, Purdue University, Nov. 2018.
 20. **Wonse Jo**, Jee Hwan Park, Yuta Hoashi, and Byung-Cheol Min, “An Autonomous Multi-robot System for Harmful Algae Control,” *2018 the 5th Annual C4E Environmental Community Mixer*, Purdue University, Oct. 2018.
 21. **Wonse Jo**, Shyam Sundar Kannan, Ramviyas Parasuraman, and Byung-Cheol Min, “Development of Material Recognition Training System for Visually Impaired People,” *2018 The Health and Disease: Science, Technology, Culture and Policy*, Purdue University, Mar. 2018.

Patents

1. **Wonse Jo**, Bumjoo Lee, and Donghan Kim, “Apparatus and Method of Measuring Bowing Force,” *Korean Patent*, Patent No. 10-1694720, Jan. 2017.
2. **Wonse Jo**, Bumjoo Lee, and Donghan Kim, “Apparatus for Evaluating Sound Quality and method for the same,” *Korean Patent*, Patent No. 10-1699457, Jan. 2016.
3. **Wonse Jo**, Hyunjun Park, and Donghan Kim, “Sterilization case for mobile electronic device,” *Korean Patent*, Patent No. 10-1616913, April 2016. (Transferred into a company)

Online Repositories

1. **Spot Report Secondary Task: Spot Report** 2023
 - Site: <https://github.com/UMich-MAVRIC/SpotReport>
 - Details: This repository disseminates the spot report task, a Pygame-based implementation of a secondary task used in human-robot interaction (HRI) experiments.
2. **Stimuli GUI Program for Affective Loads: SMART-TeleLoad** 2023
 - Site: <https://github.com/SMARTlab-Purdue/SMART-TeleLoad>
 - Details: This package is to introduce a stimuli program which is designed to generate various affective loads, such as emotional and cognitive loads.
3. **ROS2 Wearable Biosensor Package: ros2-foxy-wearable-biosensors** 2021
 - Site: <https://github.com/SMARTlab-Purdue/ros2-foxy-wearable-biosensors>
 - Details: This package is to connect a latest wearable biosensors with ROS 2 system to minimize technology entry barriers. It is generated by collaboration with University of California Santa Cruz.
4. **ROS2 Swarm Mobile Robot Platform: SMARTmBOT** 2021
 - Site: <https://github.com/SMARTlab-Purdue/SMARTmBOT>
 - Details: The *SMARTmBOT* is an opensource and low-cost swarm mobile robot platform supporting ROS2.
5. **ROS2 Vertically Symmetrical Unmanned Surface Vessel (VSUSV)** 2021
 - Site: https://github.itap.purdue.edu/ByungcheolMinGroup/smart_mboat_ws
 - Details: The *VSUSV* is for bathymetric and water quality surveys of surface waters by cooperating with multiple VSUSVs.
6. **ROS-based Emotion and Workload Dataset for Human-Robot Interaction** 2019

- *Site*: <https://purr.purdue.edu/projects/affectiverobotics>
- *Details*: This is a new rosbag-based affective dataset including physiological and behavioral sensor data collected from 30 participants.
- 7. **Harmful Algae Removal USV: *SMARTmBoat-05*** 2019
 - *Site*: <https://github.com/SMARTlab-Purdue/Harmful-Algae-Removal-USV>
 - *Details*: The *SMARTmBoat-05* is an open-source, USV platform developed for algae removal.
- 8. **A Small USV platform for Water Quality Monitoring: *SMARTmBoat-03*** 2019
 - *Site*: <https://osf.io/wsnrt/>
 - *Details*: The *SMARTmBoat-03* is an open-source, small USV platform capable of measuring water quality for monitoring.

AWARDS AND HONORS

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|---|-----------------------------|
| UMPDA Professional Development Award
University of Michigan Postdoctoral Association, University of Michigan, Ann Arbor, MI USA | <i>March. 2024</i> |
| UMPDA Conference Award
University of Michigan Postdoctoral Association, University of Michigan, Ann Arbor, MI USA | <i>Feb. 2024</i> |
| Second Runner Up
2022 Spring Polytechnic Research Impact Area Student Poster Symposium
Polytechnic Institute, Purdue University, West Lafayette, IN USA | <i>May. 2022</i> |
| 2021-22 Best Member of Year Award
SMART Lab, Purdue University, West Lafayette, IN USA | <i>May 2022</i> |
| Excellent Paper Award
<i>2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)</i>
<i>Workshop on HMRS 2021: Cognitive and Social Aspects of Human Multi-Robot Interaction</i> | <i>Jan. 2022</i> |
| NASA Qualification Winner (Finalist)
Space Robotics Challenge Phase 2, NASA Space center Houston, TX USA | <i>Jan. 2021</i> |
| Best Presentation Award
2020 the Realizing the Digital Enterprise (RDE) Student Showcase “Mini-Talk” event
Polytechnic Institute, Purdue University, West Lafayette, IN USA | <i>Nov. 2020</i> |
| Finalist in OCEANS Student Poster Competition
2019 MTS/IEEE OCEANS Conference, Seattle, WA USA. | <i>Oct. 2019</i> |
| 2018-19 Best Member of Year Award
SMART Lab, Purdue University, West Lafayette, IN USA | <i>May 2019</i> |
| Graduate Student Fellowship
Purdue University, West Lafayette, IN USA | <i>Aug. 2018 – May 2019</i> |
| Best Student Poster Presentation Award
2018 the Realizing the Digital Enterprise (RDE) Poster Session
Purdue University, West Lafayette, IN USA | <i>Dec. 2018</i> |
| 2017-18 Best Member of Year Award
SMART Lab, Purdue University, West Lafayette, IN USA | <i>May 2018</i> |

KT Education Scholarship*Dec. 2013 – Jan. 2015*

Smart Life Service TF Lab

KT Institute of Convergence Technology, South Korea

Mayor's Award for Useful Idea Prize*Nov. 2012*

The Creative and Intelligent Robot Contest (CIRO)

Chung-Nam University, South Korea

2nd Place Award of Useful Idea Prize*Nov. 2011*

The Capstone Design Contest, Hoseo University, South Korea

3rd Place Award of Useful Idea Prize*Nov. 2010*

The Capstone Design Contest, Hoseo University, South Korea

Academic Scholarships*2007 – 2012*

Awarded to the student for outstanding GPA by Hoseo University, South Korea

GRANT WRITING EXPERIENCES**2019 OCEANS Travel Grant***2019*- *Title:* Development of an Unmanned Surface Vehicle for Harmful Algae Removal- *Sponsor:* The IEEE Oceanic Engineering Society (OES) and The Marine Technology Society, USA- *Amount:* \$2,047**FY18-19 Purdue Research Foundation Graduate Fellowship***2018 – 2019*- *Title:* Towards Autonomous Robotic Systems for Control of Harmful Algae Blooms- *Sponsor:* Purdue Research Foundation (PRF), Purdue University, West Lafayette, IN USA- *Amount:* \$30,144**Additionally, I wrote parts of the technical components of the proposals:**

- U.S. Army GVSC-ARL STRONG Cycle 6: Shared Situational Awareness and Abstracted Communication in Hierarchical Human-AI Military Teams, Sponsor: U.S. Army GVSC, PI: Dr. Lionel Roboert, Amount: \$136,000. (submitted; \$100,000 per year renewable for up to 3 years)
- U.S. Army GVSC-ARC: Enhancing UGV Navigation with Adaptive Human Intervention, Sponsor: U.S. Army GVSC, PI: Dr. Dawn Tilbury, Amount: \$136,000. (awarded; \$100,000 per year renewable for up to 3 years)
- NSF CAREER: Adaptive Human Multi-robot Systems, Sponsor: National Science Foundation, PI: Dr. Byung-Cheol Min, Amount: \$500,000. (awarded)
- DARPA-YFA: Deep Reinforcement Learning for Damage Tolerance in Multi-robot Systems, Sponsor: Defense Advanced Research Projects Agency, PI: Dr. Byung-Cheol Min. (declined)
- ONR-YIP: Non-contact based Object Transport with Multi-Robot Systems, Sponsor: Office of Naval Research, PI: Dr. Byung-Cheol Min (declined)

TEACHING EXPERIENCES**Invited talk:** Affective Computing for Human-Robot Interaction Research*2023*

- Embedded Security & Privacy (ESP) Lab

- Department of Electrical Engineering, Hanyang University, Ansan, South Korea

Invited talk: Affective Robotics Research*2023*

- Department of Robotics, Hoseo University, Asan, South Korea

- Instructor:** Affective Workload Allocation System For Multi-human Multi-robot Teams 2022
 - Outreach Seminar, Macau Anglican College High School, Macau, China
- Gesture Lecture:** ROS2 wearable biosensor package for Affective Human-Robot Interaction 2021
 - *Course:* CNIT 581 Introduction to Assistive Technology and Robotics,
 - Polytechnic Institute, Purdue University, West Lafayette, IN USA
- Instructor:** Development of multi-robot platform for STEM education 2021
 - Outreach Seminar, Purdue Polytechnic High School, Indianapolis, IN USA
- Gesture Lecture:** ROS2 based Opensource Mobile Robot Platform: SMARTmBOT 2021
 - *Course:* CNIT 581 Software Design and Development in Robotics,
 - Polytechnic Institute, Purdue University, West Lafayette, IN USA
- Instructor:** Affective human-multi-robot interaction system 2020
 - Outreach Seminar, Purdue Polytechnic High School, Indianapolis, IN USA
- Gesture Lecture:** Robot simulator programming: Webots 2019
 - *Course:* CNIT 581 Software Design and Development in Robotics
 - Polytechnic Institute, Purdue University, West Lafayette, IN USA
- Instructor:** Multi-robot system using human emotional state 2019
 - Outreach Seminar, Purdue Polytechnic High School, Indianapolis, IN USA
- Teaching Assistant:** Design of electronic circuits and autonomous control systems 2014 – 2015
 - Department of Electronics and Radio Engineering, Kyung Hee University, South Korea
 - *Courses:* Electronic circuit and Automatic Control Systems
- Instructor:** Basic STEM robotics 2011 – 2012
 - Korea Robot Sports Association (KRSA), South Korea
 - *Course:* STEM robotics for K-12 students

MENTORING EXPERIENCES

- Kriti Gupta** 2024–present
 B.S., Computer Science, University of Michigan
- Kajal Awasthi** 2024
 M.S., Robotics Department, University of Michigan
- Yanran (Belinda) Lin** 2023–2024
 B.S., Computer Science, University of Michigan
- Go-eum Cha** 2020–2023
 M.S., Computer and Information Technology, Purdue University
 - She is now pursuing Ph.D. degree at Purdue University, IN USA
- Revanth Krishna Senthilkumaran** 2022
 B.S., School of Electrical and Computer Engineering, Purdue University
- Jaeeun Kim** 2020–2021
 B.S., Robotics Engineering Technology, Purdue University
 - She is now pursuing M.S. degree at Purdue University, IN USA

Pou Hei Chan*2020–2021*

B.S., Aeronautical and Astronautical Engineering, Purdue University
 - He is now pursuing Ph.D. degree at Texas A&M University, TA USA

Walter Kruger*2019–2020*

B.S., Robotics Engineering Technology, Purdue University
 - He is now pursuing M.S. degree at University of Michigan, MI USA

Yuta Hoashi*2018–2020*

B.S., Mechanical Engineering, Purdue University
 - He got M.S. degree at Carnegie Mellon University (CMU), PA USA

Jee Hwan Park*2018–2020*

B.S. and M.S., Mechanical Engineering, Purdue University
 - He is now working at Hyundai Motor Company, South Korea.

PROFESSIONAL ACTIVITIES**Workshop Organizer:**

1. Co-organizer, ACM/IEEE International Conference on Human-Robot Interaction *2024*
 - Title: “Taking a Closer Look: Refining Trust and its Impact in HRI”

Research Committee:

1. Member: Technical Committee, IEEE RAS TC for Cognitive Robotics *2021–Present*

Journal Reviewer:

1. Scientific Reports – Nature *2024*
2. Robotics and Autonomous Systems *2024*
3. Ergonomics *2023*
4. International Journal of Fuzzy Logic and Intelligent Systems (IJFIS) *2021, 2023*
5. International Open Access Journal of HardwareX *2020 – 2021, 2023*
6. IEEE Transactions on Mobile Computing *2018*
7. Electronics and Telecommunications Research Institute (ETRI) *2018*

Conference Reviewer:

1. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2024) *2024*
2. ACM/IEEE International Conference on Human-Robot Interaction (HRI 2024) *2023*
3. IEEE International Conference on Robotics and Automation (ICRA 2024) *2023*
4. International Symposium on Multi-Robot and Multi-Agent Systems (MRS 2023) *2023*
5. IEEE International Conference on Robotics and Automation (ICRA 2022) *2022*
6. IEEE International Conference on Robotics and Automation (ICRA 2021) *2021*
7. IEEE International Conference on Robotics and Automation (ICRA 2020) *2020*
8. IEEE Robotics and Automation Letters (RA-L) *2019*
9. ACM/IEEE International Conference on Human-Robot Interaction (HRI 2019) *2019*
10. IEEE International Conference on Robotics and Automation (ICRA 2019) *2019*
11. IEEE International Conference on BioInformatics and BioEngineering (BIBE) 2018 *2018*
12. IEEE International Conference on Robotic Computing (IRC 2018) *2018*
13. IEEE International Conference on Robotics and Automation (ICRA 2018) *2018*

Industrial Advisory Committee:

1. Technical advisor, GENDATA (startup company), South Korea *2020 - present*

2. Technical advisor, GGOK PIL MU RYUP (startup company), South Korea

2020