Wonse Jo

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

CONTACT INFORMATION

MAVRIC Lab, FRB #3290 *Phone*: +1 (765) 421-3607
Robotics department in College of Engineering *E-mail*: wonse@umich.edu
University of Michigan, Ann Arbor, MI USA *Website*: https://wonsu0513.github.io

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
- Situation Awareness (SA) for Human-Multi-Robot Interactions
- 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

Under Review

[U2] **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).

[U1] 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.*

Peer-Reviewed Journals (14)

[J14] **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* (Early Access).

[J13] **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*, 26, pp.101757, 2024.

[J12] 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).

[J11] 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.

[J10] 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.

[J9] 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.

[J8] **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," *HardwareX*, 6, e00076, October 2019.

[J7] **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.

[J6] **Wonse Jo**, Kyeong-min Cheon, and Keun-ho Rew, "Motion Sensing System for Automation of Neuropsycological Test," *The Journal of Sensor Science and Technology*, 26(2), pp. 128-134, 2017.

[J5] **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.

[J4] 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.

[J3] 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.

[J2] 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.

[J1] **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 (12)

[C12] 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.

[C11] 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.

[C10] 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.

[C9] **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.

[C8] Shyam Sundar Kannan, **Wonse Jo**, Ramviyas 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.

🏆 [C7] **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. **[Selected as Finalist in Student Poster Competition]**

[C6] **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.

[C5] **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.

[C4] 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.

[C3] **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.

[C2] 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.

[C1] 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.

Peer-Reviewed Workshops and Reports (5)

[W/R5] 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.

[W/R4] 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.

🏆 [W/R3] **Wonse Jo**, Robert Wilson, Jaeeun 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]**

[W/R2] **Wonse Jo**, Jaeeun 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.

[W/R1] **Wonse Jo**, Jee Hwan Park, Sangjun Lee, Ahreum Lee, and 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.

Posters

🏆 [Po21] **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. **[Awarded Second Runner Up]**

🏆 [Po20] 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**]

🏆 [Po19] Jaeeun 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**]

🏆 [Po18] **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**]

🏆 [Po17] 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**]

[Po16] Jaeeun 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.

[Po15] 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.

[Po14] **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.

🏆 [Po13] **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**]

[Po12] Jaeeun 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.

[Po11] 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.

🏆 [Po10] 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**]

[Po9] **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.

[Po8] 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.

[Po7] **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.

[Po6] 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.

[Po5] Jun Han Bae, Yogang Singh, **Wonse Jo**, Yuta Haoshi, 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.

🏆 [Po4] **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**]

[Po3] Shyam Sundar Kannan, **Wonse Jo**, and Byung-Cheol Min, "Development of taping multi robot," *2018 the Dawn or Doom 2018 emerging technology conference*, Purdue University, Nov. 2018.

[Po2] **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.

[Po1] **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

[P3] **Wonse Jo**, Bumjoo Lee, and Donghan Kim, "Apparatus and Method of Measuring Bowing Force," *Korean Patent*, Patent No. 10-1694720, Jan. 2017.

[P2] **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.

[P1] **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; BASS LIGHT)

Online Repositories

[R9] **Multi-Modal Transformer for Human State Recognition:** *Husformer* *2023*
- *Site*: https://github.com/SMARTlab-Purdue/Husformer
- *Details*: This repository contains the source code for an end-to-end multi-modal transformer framework for multi-modal human state recognition.

[R8] **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.

[R7] **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.

🏆 [R6] **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.

[R5] **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.

[R4] **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.

[R3] **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.

🏆 [R2] **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.

[R1] **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

UMPDA Professional Development Award *March. 2024*
University of Michigan Postdoctoral Association, University of Michigan, Ann Arbor, MI USA

UMPDA Conference Award *Feb. 2024*
University of Michigan Postdoctoral Association, University of Michigan, Ann Arbor, MI USA

Second Runner Up *May. 2022*
2022 Spring Polytechnic Research Impact Area Student Poster Symposium
Polytechnic Institute, Purdue University, West Lafayette, IN USA

2021-22 Best Member of Year Award *May 2022*
SMART Lab, Purdue University, West Lafayette, IN USA

Excellent Paper Award *Jan. 2022*
2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (*IROS*)
Workshop on HMRS 2021: *Cognitive and Social Aspects of Human Multi-Robot Interaction*

NASA Qualification Winner (Finalist) *Jan. 2021*
Space Robotics Challenge Phase 2, NASA Space center Houston, TX USA

Best Presentation Award *Nov. 2020*
2020 the Realizing the Digital Enterprise (RDE) Student Showcase "Mini-Talk" event
Polytechnic Institute, Purdue University, West Lafayette, IN USA

Finalist in OCEANS Student Poster Competition *Oct. 2019*
2019 MTS/IEEE OCEANS Conference, Seattle, WA USA.

2018-19 Best Member of Year Award *May 2019*
SMART Lab, Purdue University, West Lafayette, IN USA

Graduate Student Fellowship *Aug. 2018 – May 2019*
Purdue University, West Lafayette, IN USA

Best Student Poster Presentation Award *Dec. 2018*
2018 the Realizing the Digital Enterprise (RDE) Poster Session
Purdue University, West Lafayette, IN USA

2017-18 Best Member of Year Award *May 2018*
SMART Lab, Purdue University, West Lafayette, IN USA

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 (HRI) *2024*
   - Title: "Taking a Closer Look: Refining Trust and its Impact in HRI"

Conference Committee:

1. Member: AC role, ACM International Conference on Automotive User Interfaces and Interactive Vehicular Applications (AutomotiveUI) *2024*

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

Research Committee:

1. Member: Technical Committee, IEEE RAS TC for Cognitive Robotics *2021 - present*

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*