

SMART LAB BY THE NUMBERS IN 2023

* Emoticons from <http://lancastergeneralhealth.org/>



13

LAB MEMBERS



12

HONORS/AWARDS



32

LAB MEETINGS



25

LAB SEMINARS



10, \$6.9M

GRANTS PROPOSED



3, \$3.2M

GRANTS AWARDED & PENDING



11

JOURNAL PAPERS PUBLISHED
& UNDER REVIEW



8

CONFERENCE PAPERS PUBLISHED
& UNDER REVIEW



11

POSTERS & TALKS PRESENTED



3

INVITED TALKS



5

GITHUB REPOSITORIES



3

MEDIA APPEARANCES



3,665

WEBSITE UNIQUE VISITS



5,474

YOUTUBE VIEWS



Narrative version available at
<https://tinyurl.com/PurdueSMARTLab2023>



Purdue SMART Lab 2023 Year in Review

December 2023



Lab Overview

The Smart Machine and Assistive Robotics Technology (SMART) Lab was established in 2015 by Dr. Byung-Cheol (“B.C.”) Min. Since its establishment, 4 Postdocs, 6 PhD students, 5 MS students, 10 Undergrad students, 2 Visiting scholars, and 3 Visiting students have completed their research programs. In 2023, the lab was associated with 1 Director, 6 PhD students, 1 MS student, and 3 Undergrad students. The SMART Lab is an interdisciplinary lab consisting of members with diverse academic backgrounds. It conducts both basic and applied research on robotics with regard to its scientific and engineering aspects and combines practical and theoretical approaches to solve real-world problems. Their primary research topics include multi-robot systems, human-robot interaction, robot learning, and robot design & control, with a focus on applications in field robotics, and assistive technology and robotics.

Lab Meetings/Seminars

Lab Meetings

- In 2023, the lab conducted a total of 32 group meetings. During the spring semester, these meetings took place every Friday from 3pm to 5pm in the DUDL facility, and during the fall semester, they occurred from 2:30pm to 4:30pm in the POTR facility.

Lab Seminars

- During the spring semester, PhD students conducted 5 technical seminars in which they reviewed and discussed the latest robotics papers published in journals/conferences such as RA-L, ICRA, IROS, CoRL from 2021 to the present. They also held 5 latest paper review seminars, during which they reviewed and discussed classical robotics papers that had a significant impact on their research. Additionally, undergraduate students delivered 3 research update presentations.
- During the fall semester, both PhD students and undergraduate students conducted 7 latest paper review seminars and 5 classical paper review seminars.

Lab Members

Current Members (10)

- **Byung-Cheol Min** (Director) was elevated to IEEE Senior Member, and was elected to the University senate. Dr. Min delivered 3 invited talks at international universities, including those in the UK and Korea.
- **Shyam Kannan** (PhD Student) served as a GA for Purdue’s Library. He published 2 IROS papers: 1 as a first author and 1 as a co-author, submitted 2 ICRA papers: 1 as a co-first author and 1 as a co-author, and 1 journal paper as a co-author, and presented 3 posters and talks: 1 as a first author and 2 as a co-author. He also published 1 open-source programming repository via GitHub. He received travel grants from Purdue Graduate Student Government (PGSG), Purdue Polytechnic Dean’s Office, and the Dept of Computer and Information Technology. Shyam co-mentored 1 undergrad student, and successfully passed his PhD proposal defense during the fall semester.
- **Go-Eum Cha** (PhD Student) served as a TA for Dr. Min during the fall semester. She published 1 IROS paper as a first author, submitted 1 journal paper as a co-author, and presented 2 posters and talks: 1 as a first author and 1 as a co-author. She was awarded the IEEE Robotics and Automation Society (RAS) Travel Grants for IROS 2023 and received travel grants from Purdue Polytechnic Dean’s Office, and the Dept of Computer and Information Technology. Go-Eum served as a lab committee chair during the fall semester, and mentored 2 undergrad students.
- **Vishnunandan Venkatesh** (PhD Student) served a TA for Prof. Salem. He published 1 IROS paper as a co-author, submitted 2 ICRA papers: 1 as a co-first author and 1 as a co-author, and presented 3 posters and talks: 1 as a first author and 2 as a co-author. He also published 1 open-source programming repository via

GitHub. He served as a lab committee member during the spring semester, and co-mentored 1 undergrad student. Vishnu successfully passed his PhD preliminary exam during the fall semester.

- **Ruiqi Wang** (PhD Student) served as a RA for Dr. Min. He published 2 IROS papers: 1 as a first author and 1 as a co-author, published 1 archive paper as a co-author, submitted 1 ICRA paper as a co-author and 4 IEEE journal papers: 3 as a co-first author and 1 as a co-author, and presented 2 posters and talks: 1 as a first author and 1 as a co-author. He also published 2 open-source programming repositories via GitHub. He received travel grants from Purdue Graduate Student Government (PGSG), Purdue Polytechnic Dean's Office, and the Dept of Computer and Information Technology. Ruiqi served as a lab committee chair during the spring semester, mentored 1 undergrad student.
- **Weizheng Wang** (PhD Student) published 1 IROS paper as a first author, submitted 1 ICRA paper as a first author and 2 IEEE journal papers: 1 as a co-first author and 1 as a co-author, and presented 1 poster and talk as a first author. He also published 1 open-source programming repository via GitHub. He received travel grants from Purdue Polytechnic Dean's Office, and the Dept of Computer and Information Technology. Weizheng served as a lab committee member during both the spring and fall semesters.
- **Taehyeon Kim** (PhD Student) started his PhD studies in August 2023. He served as a RA for Dr. Min. Taehyeon submitted 1 ICRA paper as a co-first author and published 1 open-source programming repository on GitHub.
- **Jeremy Pan** (MS Student) is currently pursuing his MS degree while working for Boeing.
- **Arjun Gupte** (Undergrad Student) joined the lab in March 2023. He served as a RA for Dr. Min. He submitted 1 IEEE journal paper a co-author, and presented 1 poster and talk as a first author. He also published 1 open-source programming repository via GitHub. Arjun served as a lab committee member during the fall semester.
- **Dayoon Suh** (Undergrad Student) joined the lab in November 2023. Her current research focuses on deep learning for computer vision in the context of robotics applications.

Lab Alumni (3)

- **Pou Hei (Gavin) Chan** (Undergrad Student) completed his BS studies in May 2023 and has started his PhD at Texas A&M University as a direct PhD student. He presented 2 posters as a first author.
- **Revanth Krishna Senthilkumaran** (Undergrad Student) completed his research and left the lab in August 2023. He submitted 1 journal paper as a co-author, 1 conference paper as a co-author, presented 2 posters as a first author.
- **Soomin Kim** (Undergrad Student) completed her BS studies in May 2023. She presented 1 poster as a first author.

New Lab Members (3)

- **Taehyeon Kim** (PhD Student) joined the lab in August 2023 as a PhD student. He obtained his BS and MS degrees in Electronic Engineering from Kyung Hee University, with his MS thesis titled "A Study on Integrated Controller for Mobile Manipulator based on Navigation Path Analysis". Taehyeon's main research interests include context-aware navigation, human-robot interaction, machine vision, mobile manipulator control.
- **Dayoon Suh** (Undergrad Student) joined the lab in November 2023. She is an undergrad student majoring in Data Science & Applied Statistics. Dayoon's research interests include perception and computer vision, and human-robot interaction.
- **Arjun Gupte** (Undergrad Student) joined the lab in March 2023. He is an undergrad student majoring in Computer Engineering. Arjun's research interests include human-robot interaction, multi-agent robotics systems, perception and sensing, and assistive/bio-inspired robots.

Faculty Accomplishments & Awards (1)

- Dr. Min was elevated to IEEE Senior Member, August 2023.

Student Accomplishments & Awards (11)

- Shyam Sundar Kannan received the Purdue Graduate Student Government (PGSG) Travel Grant Award, September 2023.
- Shyam Sundar Kannan received a Purdue Polytechnic Dean's Graduate Student Travel Grant Award, September 2023.
- Shyam Sundar Kannan received a Purdue Computer and Information Technology Graduate Student Travel Grant Award, September 2023.
- Ruiqi Wang received the Purdue Graduate Student Government (PGSG) Travel Grant Award, September 2023.
- Ruiqi Wang received a Purdue Polytechnic Dean's Graduate Student Travel Grant Award, September 2023.
- Ruiqi Wang received a Purdue Computer and Information Technology Graduate Student Travel Grant Award, September 2023.
- Weizheng Wang received a Purdue Polytechnic Dean's Graduate Student Travel Grant Award, September 2023.
- Weizheng Wang received a Purdue Computer and Information Technology Graduate Student Travel Grant Award, September 2023.
- Go-Eum Cha received a Purdue Polytechnic Dean's Graduate Student Travel Grant Award, September 2023.
- Go-Eum Cha received a Purdue Computer and Information Technology Graduate Student Travel Grant Award, September 2023.
- Go-Eum Cha was awarded the IEEE Robotics and Automation Society (RAS) Travel Grants for IROS 2023, September 2023.

Grant Proposals (10 submitted, 3 pending, 7 declined)

Submitted (10, \$6.9M)

- Human Modelling and Task Allocation for Multi-human Multi-robot Teams, Role: PI, Sponsor: U.S. Army Research Lab, Amount: \$550,000 (06/01/2024 – 05/31/2026).
- LCM: Enable Transformative Field Laboratory Hub for Engineering and Technology Education Through a Learner-Centered Multi-Remote-Learner Multi-Robot System, Role: Co-PI (PI: Jin Wei-Kocsis), Sponsor: Institute of Education Sciences, Amount: \$2,000,000 (07/01/2024 – 06/30/2028).
- Situation-aware and Adaptive External Machine Interface and Modalities of Personal Autonomous Vehicles in Urban Environment, Role: PI, Sponsor: Hyundai Motors, Amount: \$45,000 (12/15/2023 – 08/15/2024).
- Path Planning for Multi-PAV (Personal Air Vehicle) to Reduce Light Pollution, Role: PI, Sponsor: Hyundai Motors, Amount: \$45,000 (12/15/2023 – 08/15/2024).
- Towards Seamless Robot Adaptation in Human-Robot Interaction: Efficient Understanding and Learning from Human Feedback, Role: PI, Sponsor: National Science Foundation, Amount: \$391,889 (05/01/2024 – 04/30/2027).
- Counterventions: disrupting ableist research norms in HRI, Role: Co-PI (PI: Rua Williams), Sponsor: National Science Foundation, Amount: \$696,786 (08/01/2024 – 07/31/2027).
- CPS: Medium: Vision-Based Robotic Closed-Loop Sensing and Control for Enhanced Human Indoor Thermal Comfort, Role: PI, Sponsor: National Science Foundation, Amount: \$851,418 (01/01/2024 – 12/31/2026).
- Development of Autonomous Drones for Enhanced Environmental Monitoring, Role: PI, Sponsor: Universidad Nacional de San Agustín, Amount: \$792,476 (08/01/2023 – 07/31/2026).
- Development of a Wireless Sensor Network and IoT-based System for Real-Time Monitoring of Mining Operations in Extreme Environments, Role: PI, Sponsor: Universidad Nacional de San Agustín, Amount: \$776,776 (08/01/2023 – 07/31/2026).
- Development of a Multi-Robot System for Bathymetric and Water Quality Surveys, Role: PI, Sponsor: Universidad Nacional de San Agustín, Amount: \$792,476 (08/01/2023 – 07/31/2026).

Pending (3, \$3.2M)

- Human Modelling and Task Allocation for Multi-human Multi-robot Teams, Role: PI, Sponsor: U.S. Army Research Lab, Amount: \$550,000 (06/01/2024 – 05/31/2026).
- LCMM: Enable Transformative Field Laboratory Hub for Engineering and Technology Education Through a Learner-Centered Multi-Remote-Learner Multi-Robot System, Role: Co-PI (PI: Jin Wei-Kocsis), Sponsor: Institute of Education Sciences, Amount: \$2,000,000 (07/01/2024 – 06/30/2028).
- Counterventions: disrupting ableist research norms in HRI, Role: Co-PI (PI: Rua Williams), Sponsor: National Science Foundation, Amount: \$696,786 (08/01/2024 – 07/31/2027).

Declined (7, \$3.7M)

- Towards Seamless Robot Adaptation in Human-Robot Interaction: Efficient Understanding and Learning from Human Feedback, Role: PI, Sponsor: National Science Foundation, Amount: \$391,889 (05/01/2024 – 04/30/2027).
- CPS: Medium: Vision-Based Robotic Closed-Loop Sensing and Control for Enhanced Human Indoor Thermal Comfort, Role: PI, Sponsor: National Science Foundation, Amount: \$851,418 (01/01/2024 – 12/31/2026).
- Situation-aware and Adaptive External Machine Interface and Modalities of Personal Autonomous Vehicles in Urban Environment, Role: PI, Sponsor: Hyundai Motors, Amount: \$45,000 (12/15/2023 – 08/15/2024).
- Path Planning for Multi-PAV (Personal Air Vehicle) to Reduce Light Pollution, Role: PI, Sponsor: Hyundai Motors, Amount: \$45,000 (12/15/2023 – 08/15/2024).
- Development of Autonomous Drones for Enhanced Environmental Monitoring, Role: PI, Sponsor: Universidad Nacional de San Agustín, Amount: \$792,476 (08/01/2023 – 07/31/2026).
- Development of a Wireless Sensor Network and IoT-based System for Real-Time Monitoring of Mining Operations in Extreme Environments, Role: PI, Sponsor: Universidad Nacional de San Agustín, Amount: \$776,776 (08/01/2023 – 07/31/2026).
- Development of a Multi-Robot System for Bathymetric and Water Quality Surveys, Role: PI, Sponsor: Universidad Nacional de San Agustín, Amount: \$792,476 (08/01/2023 – 07/31/2026).

Current Funded Research Projects (3, \$1.7M)

- FW-HTF-P: Interactive Multi-Human Multi-Remote-Robot Operations for the Future of Construction Work, Role: Co-PI (PI: Jin Wei-Kocsis), Sponsor: National Science Foundation, Amount: \$150,000 (10/01/2022 – 05/31/2024).
- CAREER: Adaptive Human Multi-Robot Systems, Role: PI, Sponsor: National Science Foundation, Amount: \$500,000 (02/15/2019 – 01/31/2025).
- PFI-RP: Partnerships for Innovation in Interoperable Building Information Modeling Technology for Applications in Automated Building Code Compliance Checking and Modular Construction Automation, Role: Co-PI (Jiansong Zhang), Sponsor: National Science Foundation, Amount: \$1,108,003 (09/15/2018 – 08/31/2024).

Completed Funded Research Projects (1, \$541K)

- CPS: Medium: Collaborative Research: Closed Loop Sustainable Precision Animal Agriculture, Role: Co-PI (PI: Richard Voyles), Sponsor: National Institute of Food and Agriculture, Amount: \$541,448 (09/01/2018 – 08/31/2023).

Publications (3 journals, 5 conferences, 1 archive, & 11 papers under review)*Journals* (3)

- Geunsu Kim, Soohyeok Kang, Gyudo Park, and Byung-Cheol Min, “Electric Vehicle Battery State of Charge Prediction Based on Graph Convolutional Network”, *International Journal of Automotive Technology*, Vol 24, pp. 1519-1530, 2023.

- Upinder Kaur, Victor M. R. Malacco, Huiwen Bai, T. P. Price, Arunashish Datta, Lei Xin, Shreyas Sen, Robert A. Nawrocki, George Chiu, Shreyas Sundaram, Byung-Cheol Min, Kristy M. Daniels, Robin R. White, Shawn S. Donkin, Luiz F. Brito, and Richard M. Voyles, “Invited Review: Integration of Technologies and Systems for Precision Animal Agriculture – A Case Study on Precision Dairy Farming”, *Journal of Animal Science*, June 2023.
- Ramvijas Parasuraman, Byung-Cheol Min, and Petter Ögren, “Rapid Prediction of Network Quality in Mobile Robots”, *Ad Hoc Networks*, Vol. 138, 103014, January 2023.

Conferences (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, USA, October 1-5, 2023.
- Ruiqi Wang, Dezhong Zhao, and Byung-Cheol Min, “Initial Task Allocation for Multi-Human Multi-Robot Teams with Attention-based Deep Reinforcement Learning”, 2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2023), Detroit, USA, October 1-5, 2023.
- Shyam Sundar Kannan, L.N. Vishnunandan Venkatesh, Revanth Krishna Senthilkumaran, and Byung-Cheol Min, “UPPLIED: UAV Path Planning for Inspection through Demonstration”, 2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2023), Detroit, USA, October 1-5, 2023.
- 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, USA, October 1-5, 2023.
- Weizheng Wang, Ruiqi Wang, Le Mao, and Byung-Cheol Min, “NaviSTAR: Benchmarking Socially Aware Robot Navigation with Hybrid Spatio-Temporal Graph Transformer and Active Learning”, 2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2023), Detroit, USA, October 1-5, 2023.

Archive (1)

- Ike Obi, Ruiqi Wang, Prakash Chandra Shukla, and Byung-Cheol Min, “Robot Patrol: Using Crowdsourcing and Robotic Systems to Provide Indoor Navigation Guidance to The Visually Impaired”, arXiv preprint arXiv:2306.02843, 2023.

Papers Under Review (11)

- Weizheng Wang*, Le Mao*, and Byung-Cheol Min (* equal contribution), “Hyper-STTN: Social Group-aware Spatial-Temporal Transformer Network for Human Trajectory Prediction with Hypergraph Reasoning”, *IEEE Robotics and Automation Letters*.
- Ruiqi Wang*, Dezhong Zhao*, Arjun Gupte, and Byung-Cheol Min (* equal contribution), “Initial Task Assignment in Multi-Human Multi-Robot Teams: An Attention-enhanced Hierarchical Reinforcement Learning Approach”, *IEEE Robotics and Automation Letters*.
- Wonse Jo, Go-Eum Cha, Dan Foti, and Byung-Cheol Min, “SMART-TeleLoad: A New Graphic User Interface to Generate Affective Loads for Teleoperation”, *SoftwareX*.
- Shyam Sundar Kannan, L.N. Vishnunandan Venkatesh, and Byung-Cheol Min, “SMART-LLM: Smart Multi-Agent Robot Task Planning using Large Language Models”, *International Conference on Robotics and Automation (ICRA)*, Yokohama, Japan, May 13-17, 2024.
- Weizheng Wang, Le Mao, Ruiqi Wang, and Byung-Cheol Min, “Multi-Robot Cooperative Socially-Aware Navigation using Multi-Agent Reinforcement Learning”, *International Conference on Robotics and Automation (ICRA)*, Yokohama, Japan, May 13-17, 2024.
- Gyeongmin Kim, Taehyeon Kim, Shyam Sundar Kannan, L.N. Vishnunandan Venkatesh, Donghan Kim, and Byung-Cheol Min, “DynaCon: Dynamic Robot Planner with Contextual Awareness via LLMs”, *International Conference on Robotics and Automation (ICRA)*, Yokohama, Japan, May 13-17, 2024.
- 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*.
- 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 Systems*.

- 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.
- Jun Han Bae, Pou Hei Chan, Yongho Kim, Richard M. Voyles, Sara K. Mcmillan, Bumjoo Lee, Mauricio Postigo-Malaga, Edgard Gonzales Zenteno, Jose Garcia-Bravo, Brittany Newell, J. Eric Dietz, and Byung-Cheol Min, “Uncrewed Remote Underwater Robotic Sediment Core Sampler”, IEEE Journal of Oceanic Engineering.
- 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.

Poster Presentations & Talks (11)

- Arjun Gupte, Ruiqi Wang, and Byung-Cheol Min, “Modeling and Simulating Initial Task Allocation in Multi-Human Multi-Robot Teams”, 2023 Purdue Fall Undergraduate Research Expo, Purdue University, November 2023.
- Pou Hei Chan, Pou Ut Chan, Wai Teng Sin, Chong Weng Lei, and Byung-Cheol Min, “Indoor Navigating Survivor Emergency Response ROV (INSERR) for Flooded Indoor Environments: Prototype Progress Update”, 2023 Spring Purdue Undergraduate Research, Purdue University, April 2023.
- Revanth Krishna Senthilkumaran, Shyam Sundar Kannan, Vishnunandan Venkatesh, and Byung-Cheol Min, “PUID: Path-Planning for UAV Inspection Through Demonstration”, 2023 Purdue Spring Undergraduate Research Expo, Purdue University, April 2023.
- Soomin Kim, Go-Eum Cha, and Byung-Cheol Min, “Creating a Safer Future: The Need for Datasets on Intrusive Human Behavior Towards Service Robots”, 2023 Purdue Spring Undergraduate Research Expo, Purdue University, April 2023.
- Go-Eum Cha and Byung-Cheol Min, “Operator Personality and Task Performance in Robot Surveillance: A Statistical Analysis”, 2023 Spring Purdue Polytechnic Research Impact Area Student Poster Symposium, Purdue University, March 2023.
- Weizheng Wang and Byung-Cheol Min, “NaviSTAR: Spatio-Temporal Graph Transformer for Socially Aware Navigation”, 2023 Spring Purdue Polytechnic Research Impact Area Student Poster Symposium, Purdue University, March 2023.
- Revanth Krishna Senthilkumaran, Shyam Sundar Kannan, Vishnunandan Venkatesh, and Byung-Cheol Min, “PUID: Path-Planning for UAV Inspection Through Demonstration”, 2023 Spring Purdue Polytechnic Research Impact Area Student Poster Symposium, Purdue University, March 2023.
- Ruiqi Wang and Byung-Cheol Min, “Initial Task Allocation for Multi-Human Multi-Robot Teams”, 2023 Spring Purdue Polytechnic Research Impact Area Student Poster Symposium, Purdue University, March 2023.
- Shyam Sundar Kannan and Byung-Cheol Min, “RelocFormer: Vision Transformer-Based Long-Term Relocalization”, 2023 Spring Purdue Polytechnic Research Impact Area Student Poster Symposium, Purdue University, March 2023.
- Vishnunandan LN Venkatesh and Byung-Cheol Min, “Multi-Robot Task Learning from Demonstration with Keypoints and Soft Actor-Critic Methods”, 2023 Spring Purdue Polytechnic Research Impact Area Student Poster Symposium, Purdue University, March 2023.
- Pou Hei Chan, Pou Ut Chan, Wai Teng Sin, Chong Weng Lei, and Byung-Cheol Min, “Search and Rescue Indoor Navigating Survivor Emergency Response ROV (INSERR)”, 2023 Spring Purdue Undergraduate Research, Purdue University, April 2023.

GitHub Repositories (5)

- Ruiqi Wang, Dezhong Zhao, Arjun Gupte, and Byung-Cheol Min, “ITA_AeHRL”, GitHub, December 2023.
- Gyeongmin Kim, Taehyeon Kim, and Byung-Cheol Min, “DynaCon”, October 2023.

- Shyam Sundar Kannan, L.N Vishnunandan Venkatesh, and Byung-Cheol Min, “SMART-LLM”, October 2023.
- Wonse Jo and Byung-Cheol Min, “SMART-TeleLoad”, June 2023.
- Weizheng Wang, Ruiqi Wang, and Byung-Cheol Min, “SAN-NaviSTAR”, GitHub, April 2023.

Invited Talks (3)

- Byung-Cheol Min, “Towards Incorporating Elderly Preferences and Demonstrations into Robot Learning”, Kyung Hee University, Yongin, Korea, December 2023.
- Byung-Cheol Min, “Integrating Human Intelligence into Robot Learning”, Sheffield Hallam University, Sheffield, UK, September 2023.
- Byung-Cheol Min, “Integrating Human Intelligence into Robot Learning”, Sungkyunkwan University, Seoul, Korea, June 2023.

Lab Media Appearances (3)

- Our lab’s presence to IROS 2023 was featured in the Purdue Polytechnic’s Newsroom in the article titled “SMART Lab to have standout presence at world’s leading robotics conference”.
- Our lab’s outreach activities with a local high school were featured in the Purdue Polytechnic’s Newsroom in the article titled “Polytechnic’s SMART Lab introduces area high schoolers to the wide world of robotics”.
- Dr. Min’s collaborative research project, titled “Interactive Multi-Human Multi-Remote-Robot Operations for the Future of Construction Work” was featured in the Purdue Polytechnic’s Newsroom in the article titled “Polytechnic researchers collaborate to create framework for human-robot teamwork at construction sites”.

Outreaches & Partnerships (2)

- Ruiqi Wang, Arjun Gupte, and Dr. Min conducted an outreach event for high school students at West Lafayette Jr./Sr. High School as part of the NSF CAREER project, November 2023.
- Ruiqi Wang, Arjun Gupte, and Dr. Min conducted an outreach event for high school students at West Lafayette Jr./Sr. High School as part of the NSF CAREER project, April 2023.

Lab Website & Social Media

Lab Website

- 10,219 Page views
- 3,665 Unique visits
- 2,083 First time visits
- 1,582 Returning visits

YouTube Channel (14 new videos publicly published, 5,474 views, 46 new subscribers)

- “DynaCon: Dynamic Robot Planner with Contextual Awareness via LLMs”, September 2023.
- “[Supplementary Video] Initial Task Assignment in MH-MR Teams: An Attention-enhanced HRL Approach”, September 2023.
- “Smart Multi-Agent Robot Task Planning using Large Language Models”, September 2023.
- “[Presentation] NaviSTAR: Socially Aware Robot Navigation with Hybrid Spatio-Temporal Graph T~”, September 2023.
- “[Presentation] Beacon-based Distributed Structure Formation in Multi-agent Systems - Presentation”, September 2023.
- “[Presentation] Implications of Personality on Cognitive Workload in Robot Remote Control”, September 2023.
- “[Presentation] Initial Task Allocation for Multi-Human Multi-Robot Teams”, September 2023.
- “[Presentation] UPPLIED: UAV Path Planning for Inspection through Demonstration - Presentation”, September 2023.

- “Purdue SMART (Smart Machine and Assistive Robotics Technology) Lab Overview”, August 2023.
- “Beacon-based Distributed Structure Formation in Multi-agent Systems”, July 2023.
- “Implications of Personality on Cognitive Workload in Robot Remote Control”, July 2023.
- “UAV Path Planning for Inspection through Demonstration”, July 2023.
- “[Supplementary Video] Initial Workload Allocation for Multi-Human Multi-Robot Teams”, July 2023.
- “[Supplementary Video] NaviSTAR: Socially Aware Robot Navigation with Hybrid Spatio-Temporal Graph T~”, July 2023.

Facebook Page

- 32 new posts published.
- 218 post positive (like/love/wow) reactions.

Visit us at <http://www.smart-laboratory.org>