Yohei Hayamizu

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Last updated: November 22, 2025

RESEARCH INTERESTS

Focus Area: Robotics, Sequential Decision-Making, and Human-Robot Interaction

I develop socially grounded autonomous robots that perform complex tasks by seamlessly interacting and navigating in human-inhabited environments. My specific research interests include:

- **Dialog Navigation Systems** that are socially influential [1, 4]
- **Knowledge-based Reinforcement Learning** [10, 2, 8]
- **Knowledge Representation and Acquisition** [2, 6, 3]

EDUCATION

Ph.D. in Computer Science Aug. 2021 – Present
The State University of New York at Binghamton
GPA: 3.89/4.00 · Advisor: Prof. Shiqi Zhang

M.S. in Computer Science Apr. 2018 – Mar. 2021
University of Electro-Communications, Japan
GPA: 3.73/4.00 · Advisor: Prof. Keiki Takadama

B.E. in Computer Science Apr. 2014 – Mar. 2018
Iwate University, Japan
GPA: 3.33/4.00 · Advisor: Prof. Chon Hae Kim

PUBLICATIONS *For a complete list of publications, visit my Google Scholar profile.*

Journal Articles

1. Xiaohan Zhang*, Yan Ding*, **Yohei Hayamizu***, Zainab Altaweel*, Yifeng Zhu, Yuke Zhu, Peter Stone, Chris Paxton, Shiqi Zhang. *LLM-GROP: Visually Grounded Robot Task and Motion Planning with Large Language Models.* **The International Journal of Robotics Research 2025**. [Paper]
2. Hiroki Shiraishi, **Yohei Hayamizu**, Tomonori Hashiyama, Keiki Takadama, Hisao Ishibuchi, and Masaya Nakata. *Adapting Rule Representation With Four-Parameter Beta Distribution for Learning Classifier Systems.* **IEEE Transactions on Evolutionary Computation**, 2025. [Paper]

Conference Proceedings

1. **Yohei Hayamizu**, David DeFazio, Hrudayangam Mehta, Zainab Altaweel, Jacqueline Choe, Chao Lin, Jake Juettner, Furui Xiao, Jeremy Blackburn, Shiqi Zhang. *From Woofs to Words: Towards Intelligent Robotic Guide Dogs with Verbal Communication.* **AAAI**, 2026. [Project]
2. David DeFazio, **Yohei Hayamizu**, and Shiqi Zhang. *Learning quadruped locomotion policies using logical rules.* **International Conference on Automated Planning and Scheduling (ICAPS)**, 2024. [Paper] [Project]

3. Issei Saito, Tomoaki Nakamura, Akira Taniguchi, Tadahiro Taniguchi, **Yohei Hayamizu**, and Shiqi Zhang. *Emergence of continuous signals as shared symbols through emergent communication.* **IEEE International Conference on Development and Learning (ICDL)**, 2024. [Paper]
4. **Yohei Hayamizu**, Zhou Yu, and Shiqi Zhang. *Learning Joint Policies for Human-Robot Dialog and Co-Navigation.* **IEEE/RSJ International Conference on Intelligent Robots (IROS)**, 2023. [Paper]
5. Hiroki Shiraishi, **Yohei Hayamizu**, and Tomonori Hashiyama. *Fuzzy-UCS Revisited: Self-Adaptation of Rule Representations in Michigan-Style Learning Fuzzy-Classifier Systems.* **Genetic and Evolutionary Computation Conference (GECCO)**, 2023. [Paper]
6. Hiroki Shiraishi*, **Yohei Hayamizu***, Hiroyuki Sato, and Keiki Takadama. *Beta Distribution-based XCS Classifier System.* **IEEE Congress on Evolutionary Computation (CEC)**, 2022. (*Equal contribution) [Paper]
7. Hiroki Shiraishi, **Yohei Hayamizu**, Hiroyuki Sato, and Keiki Takadama. *Absumption based on overgenerality and condition-clustering based specialization for XCS with continuous-valued inputs.* **Genetic and Evolutionary Computation Conference (GECCO)**, 2022. **Best Paper Award (EML Track)** [Paper]
8. **Yohei Hayamizu**, Saeid Amiri, Kishan Chandan, Keiki Takadama, and Shiqi Zhang. *Guiding Robot Exploration in Reinforcement Learning via Automated Planning.* **International Conference on Automated Planning and Scheduling (ICAPS)**, 2021. [Paper] [Video] [Code]
9. Hiroki Shiraishi, Masakazu Tadokoro, **Yohei Hayamizu**, Yukiko Fukumoto, Hiroyuki Sato, and Keiki Takadama. *Misclassification Detection based on Conditional VAE for Rule Evolution in Learning Classifier System.* **Genetic and Evolutionary Computation Conference (GECCO)**, 2021. [Paper]

Workshop Proceedings

1. Xiaohan Zhang, Zainab Altaweel*, **Yohei Hayamizu***, Yan Ding, Saeid Amiri, Hao Yang, Andy Kaminski, Chad Esselink, and Shiqi Zhang. *DKPROMPT: Domain Knowledge Prompting Vision-Language Models for Open-World Planning.* **AAAI LM4Plan**, 2025. (*Equal contribution) [Paper] [Project]
2. Xiaohan Zhang, Zainab Altaweel*, **Yohei Hayamizu***, Yan Ding, Saeid Amiri, Hao Yang, Andy Kaminski, Chad Esselink, and Shiqi Zhang. *DKPROMPT: Domain Knowledge Prompting Vision-Language Models for Open-World Planning.* **CVPR EAI Workshop**, 2024. (*Equal contribution) [Paper]

RESEARCH EXPERIENCE

Research Assistant Aug. 2021 – Jul. 2022
SUNY Binghamton, Binghamton, NY

- Researched visual-dialogue navigation systems enabling robots to communicate with humans while in motion
- Validated approach through abstract simulations and experiments on real robot platforms
- Developed integrated system on Segway-based robot combining NLP, computer vision, task planning, and reinforcement learning

Visiting Researcher Mar. 2019 – Jan. 2020
SUNY Binghamton, Binghamton, NY

- Integrated reinforcement learning with task planning for efficient mobile robot exploration
- Conducted experiments in both simulations and real-world navigation tasks
- Developed Segway-based robot system for indoor navigation and delivery with optimized motion control

INDUSTRY EXPERIENCE

Research Intern – Meta-Learning Oct. 2020 – Jul. 2021
Konica Minolta, Inc., Japan
- Developed efficient learning system for robot arms using meta-learning techniques
- Built physics simulator in PyBullet and implemented system on Techman Robot platform
- Achieved rapid task adaptation and improved noise tolerance capabilities

Rover Development Engineer 2018
ARLISS Competition, Nevada, USA
- Engineered GPS-free navigation system integrating camera imagery, magnetometers, and encoders
- Designed robust hardware and software to withstand launch shocks and harsh desert conditions
- **Award:** ARLISS UNISEC Award for most challenging CanSat mission

ACADEMIC SERVICE

Reviewer: RA-L (2022, 2023), AAAI (2024, 2025, 2026), WCCI (2024)

Teaching Assistant Aug. 2022 – Present
SUNY Binghamton, Binghamton, NY

Courses taught include:
- Intelligent Mobile Robotics [CS424/524] – Spring 2025, Spring 2023
- Introduction to Artificial Intelligence [CS465/565] – Fall 2024, Summer 2024, Fall 2023, Fall 2022
- Programming Language [CS571] – Spring 2024
- Introduction to Programming in Python [CS110] – Spring 2023

TECHNICAL SKILLS

Programming Languages: Python, C/C++, ASP, PDDL, Dart
Frameworks: PyTorch, Ray, Pipecat, Django, Flutter
Robotics Software: ROS1, ROS2, Gazebo, OmniGibson, Habitat
Hardware Experience: Segway RMP 110, UR5e, Raspberry Pi, Unitree Go1, Unitree G1
Development Tools: Wandb, Git, Jira, Confluence

HONORS & AWARDS

- **Cover Feature, Watson Review:** Recognized for significant contributions to the robotic project (Summer 2025). 2025
- **GECCO Best Paper Award (EML Track)** 2022
- **UEC Meguro-kai Award** – Top 5% of students, University of Electro-Communications 2021
- **UEC President's Award for Students** – Top 10% of students, University of Electro-Communications 2021
- **SSI Excellent Paper Award** 2020
- **FIT Best Paper Award** 2020

- **ARLISS UNISEC Award** – Most challenging CanSat mission 2018
- **Iwate University Kusakari Award** – Top 5% of students, Iwate University 2018