Minyoung Hwang

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Education

Massachusetts Institute of Technology (MIT) Cambridge, MA
M.S. & Ph.D. in AeroAstro & CSAIL 09/2024 - Current

Seoul National University (SNU) Seoul, Korea
M.S. in Electrical and Computer Engineering 09/2021 - 08/2023
- Thesis: "Meta-Explore: Exploratory Hierarchical Vision-and-Language Navigation Using Scene Object Spectrum Grounding"

B.S. in Electrical and Computer Engineering 03/2017 - 08/2021
- Thesis: "Video Inference for Human Motion with Texture Generation"

Daejeon Science High School for the Gifted Daejeon, Korea
Major: Mathematics 03/2014 – 02/2017

Representative Honors

***Global Korea Scholarship for Study Abroad* (Ph.D., $80,000)**, Ministry of Education 2024 - 2026
***Presidential Science Scholarship* (Field: Mathematics)**, Ministry of Science and ICT 2017 - 2020
NeurIPS 2023 Scholar Award 10/2023
Google Student Travel Grants (up to 3 students / year, top international conferences) 03/2023
Talent Award of Korea (Field: Mathematics), Ministry of Education 11/2015
Training Lineup for IMO (International Mathematical Olympiad), Top 18 students in Korea 05/2016

PUBLICATIONS

MotIF: Motion Instruction Fine-tuning Hwang *et al.*
In Submission, 2024

Promptable Behaviors: Personalizing Multi-Objective Rewards from Human Preferences Hwang *et al.*
The IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), June 2024

Sequential Preference Ranking for Efficient Reinforcement Learning from Human Feedback Hwang *et al.*
Neural Information Processing Systems (NeurIPS), Dec. 2023

Meta-Explore: Exploratory Hierarchical Vision-and-Language Navigation Using Scene Object Spectrum Grounding Hwang *et al.*
The IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), June 2023

Improving Image-Goal Navigation with Visual Language Grounding via Image Captioning Hwang *et al.*
Conference on Information and Control Systems (CICS), Oct. 2022

Geometric Understanding of Reward Function in Multi-Agent Visual Exploration Hwang *et al.*
International Conference on Control, Automation and Systems (ICCAS), Oct. 2021

Wanna be Engineer 34 members of STEM (Including Hwang, M.)
MegaStudy Books, 2021

Work Experience

Carnegie Mellon University (CMU) Pittsburgh, PA
Research Intern 01/2024 – 06/2024
- Connecting Language to Actions & the World (CLAW) Lab (Prof. Yonatan Bisk)
- How human preferences are communicated in natural language to a robotic agent

Allen Institute for Artificial Intelligence (AI2) Seattle, WA
Research Intern 07/2023 – 12/2023

- Perceptual Reasoning and Interaction Research (PRIOR)
- Promptable Behaviors: Personalizing Multi-Objective Rewards from Human Preferences, sub. to CVPR 2024

SNU Robot Learning Laboratory Seoul, Korea
Robotics Researcher (M.S. Student) 09/2021 – 06/2023

- SeqRank for Feedback-efficient RLHF, *accepted to NeurIPS 2023* (01/2023 - 05/2023)
- Meta-Explore for Vision-and-Language Navigation, *accepted to CVPR 2023* (08/2021 - 11/2022)
- Graph Merge for Robust Path Following (08/2021 - 02/2022)

Robotics Research Intern 02/2020 – 08/2021

- Geometric Understanding of Reward Function in Multi-Agent Visual Exploration, *accepted to ICCAS 2021* (02/2021 - 10/2021)
- Video Inference for Human Motion with Texture Generation, Bachelor Thesis (08/2020 - 12/2020)
- Visual Navigation in Gibson Env2 Environment (02/2020 - 07/2020)

San Jose State University (SJSU) Silicon Valley Innovation San Jose, CA
Startup Team CEO, Startup Training Program 01/2020

- Led startup team UP-CARE (Use your Phone Camera for Health and Environment).
- Developed fall detection and alert for elderly users.

STEM, SNU Engineering College Seoul, Korea
Robotics Engineer 03/2019 – 11/2019

- Robot Dynamics and Control, Motion Planning, Computer Vision
- Developed both software and hardware of robot cleaner using 3D printers, Arduino, and computer vision open source (Google Mediapipe); led the development of control algorithm considering robot dynamics.

PROJECTS AND RESEARCH

* RL: Reinforcement Learning / CV: Computer Vision / HRI: Human-Robot-Interaction

Promptable Behaviors for Efficient Personalization of Robots |***RL, HRI, CV*** 05/2023 – 12/2023
Learning reward weights for multi-objective rewards from human preference. AI2

SeqRank for Feedback-efficient RLHF |***RL, HRI, Graph Theory*** 01/2023 – 05/2023
RLHF framework that uses sequential preference ranking to enhance the feedback efficiency. RLLAB, SNU

Meta-Explore for Vision-and-Language Navigation |***Multimodal, Graph Theory*** 07/2022 – 11/2022
Hierarchical decision-making process by recognizing semantically meaningful clues. RLLAB, SNU

Text-VLAD | ***CV, Visual Localization*** 09/2021 – 12/2021
Visual localization using text and visual features RLLAB, SNU

Influence based Reward for Communicative Multi-Agent Reinforcement Learning 03/2021 – 07/2021
Giving rewards based on credit assignment among multi agents RLLAB, SNU

Video Inference for Human Motion with Texture Generation | ***CV, Motion Estimation*** 08/2020 – 12/2020
Reconstruction of 3D multi-view video from 2D human motion video RLLAB, SNU

Visual Navigation in Gibson Env2 Environment | ***RL, Visual Navigation*** 02/2020 – 07/2020
Implementing robust path following of robots in Gibson simulator RLLAB, SNU

UP-CARE (Use your Phone Camera for Health and Environment) | ***HRI, CV*** 01/2020 – 01/2020
Fall detection for elderly using phone camera based on human pose estimation San Jose Univ., CA, US

Scrupulous Robot Cleaner with Mecanum Wheels and Pointed-shaped Inlet | ***HRI*** 03/2019 – 11/2019
Omnidirectional robot cleaner with autonomous & hand-motion controlled modes STEM, SNU

Teaching Experience

***Teaching Assistant*, Introduction to Intelligent Systems (English Lecture)** 09/2021 – 06/2022
Head TA for 2022 Spring Lecture. SNU, Korea
Managed RC car racing projects and taught students how to use ROS and Gazebo

***Major Tutor*, Signals and Systems** 03/2021 – 08/2021
Tutoring for Seoul National University ECE major subject SNU, Korea

***Undergraduate Teaching Assistant*, Introduction to Circuit Theory and Laboratory** 03/2019 – 06/2019
Supported and guided students to conduct electric circuit experiments SNU, Korea

***Tutor*, Basic Calculus** 03/2018 – 12/2020
Taught Basic Calculus 1, 2, and Basic Calculus for Biological Science. SNU, Korea

Awards

Lecture·Research Support Scholarship, Full tuition for 2022 Spring, SNU 03/2022
Grand Prize, Silicon Valley Innovation and Startup Program, San Jose State University 01/2020
1st Prize, International Capstone Design Fair, Korea University Innovation Hub Center 11/2019
2nd Prize, SNU College of Engineering Creative Design Fair, SNU College of Engineering 09/2019
Gold Medal, University Students Contest of Mathematics, Korean Mathematical Society 11/2018

Honors Affiliation and Training

MIT xPRO Robotics Essentials, Massachusetts Institute of Technology 05/2022 - 07/2022

SNU Tomorrow's Edge Membership (STEM), SNU College of Engineering Honor Society 04/2019 – Present
Selects 30 outstanding students from Seoul National University's Engineering College annually since 2010.
- 10^{th} President (07/2019 - 06/2020)

Machine Learning Theory Korea 03/2022 – Present

TODAM BOSTON, Global networking club with international graduate students 09/2020 – 12/2021

NorthEast Asia SRT (Student Round Table), International communication partnership 08/2019

Invited Talk

UW Computer Science Department 12/2023
Promptable Behaviors: Personalizing Multi-Objective Rewards from Human Preferences

CMU Language Technologies Institute 08/2023
Leveraging Human Knowledge to Robots through Interaction: from Vision to Language and Beyond

Community Involvement

SNU Vision Mentoring 07/2019 – 02/2022
Mentoring high school and undergraduate students interested in engineering and science SNU, Korea

Blended Science Festival: Motion controlled Robot Cleaner Experience 10/2019
Provided hands-on experience for students to interact with a robot cleaner. Seoul Science Park, Korea

PURME Foundation NEXON Children's Rehabilitation Hospital 03/2017 – 10/2017
Assisted disabled children with rehabilitation. Seoul, Korea

EXTRACURRICULAR ACTIVITIES

Orchestra Club Activities | ***Violin*** 2014 - 2020
Seoul National University Philharmonic Orchestra | Violin
Music Fountain : Orchestra club in Daejeon Science High School for the Gifted | *Concertmaster, 1^{st} Violin*

SKILLS

Programming: Python, C/C++, MATLAB, Arduino, OpenGL
Patent: Envelope with built-in sieve (**KR20140003720U**, 06/2014)
Languages: Korean (native fluency), English (full-professional proficiency)