

# MINYOUNG HWANG

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## EDUCATION

<b>Seoul National University (SNU)</b> <i>M.S. in Electrical and Computer Engineering</i> <ul style="list-style-type: none"><li>Master's Thesis: "Meta-Explore: Exploratory Hierarchical Vision-and-Language Navigation Using Scene Object Spectrum Grounding"</li></ul> <i>B.S. in Electrical and Computer Engineering</i> <ul style="list-style-type: none"><li>Bachelor's Thesis: "Video Inference for Human Motion with Texture Generation"</li></ul>	Seoul, Korea 09/2021 - 08/2023  03/2017 - 08/2021
<b>Daejeon Science High School for the Gifted</b> <i>Major: Mathematics</i>	Daejeon, Korea 03/2014 - 02/2017

## REPRESENTATIVE HONORS

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

## PUBLICATIONS

<b>Promptable Behaviors: Personalizing Multi-Objective Rewards from Human Preferences</b> In Submission, 2023	Hwang <i>et al.</i>
<b>Sequential Preference Ranking for Efficient Reinforcement Learning from Human Feedback</b> Neural Information Processing Systems (NeurIPS), Dec. 2023	Hwang <i>et al.</i>
<b>Meta-Explore: Exploratory Hierarchical Vision-and-Language Navigation Using Scene Object Spectrum Grounding</b> The IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), June 2023	Hwang <i>et al.</i>
<b>Improving Image-Goal Navigation with Visual Language Grounding via Image Captioning</b> Conference on Information and Control Systems (CICS), Oct. 2022	Hwang <i>et al.</i>
<b>Geometric Understanding of Reward Function in Multi-Agent Visual Exploration</b> International Conference on Control, Automation and Systems (ICCAS), Oct. 2021	Hwang <i>et al.</i>
<b>Wanna be Engineer</b> MegaStudy Books, 2021	34 members of STEM (Including Hwang, M.)

## WORK EXPERIENCE

<b>Carnegie Mellon University (CMU)</b> Research Intern <ul style="list-style-type: none"><li>Connecting Language to Actions &amp; the World (CLAW) Lab (Prof. Yonatan Bisk)</li><li>How human preferences are communicated in natural language to a robotic agent</li></ul>	Pittsburgh, PA 01/2024 - 05/2024
<b>Allen Institute for Artificial Intelligence (AI2)</b> Research Intern <ul style="list-style-type: none"><li>Perceptual Reasoning and Interaction Research (PRIOR)</li><li>Beyond the Oracle: Learning Multi-Objective Rewards for Reinforcement Learning</li></ul>	Seattle, WA 07/2023 - 12/2023

<b>Sequor Robotics</b>	Seoul, Korea
Research Manager; Head of R & D	05/2022 – 12/2022
<ul style="list-style-type: none"> <li>Developed a control algorithm for a human-following, socially-aware robot.</li> </ul>	
<b>SNU Robot Learning Laboratory</b>	Seoul, Korea
Robotics Researcher (M.S. Student)	09/2021 – 06/2023
<ul style="list-style-type: none"> <li>SeqRank for Feedback-efficient RLHF, <i>accepted to NeurIPS 2023</i> (01/2023 - 05/2023)</li> <li>Meta-Explore for Vision-and-Language Navigation, <i>accepted to CVPR 2023</i> (08/2021 - 11/2022)</li> <li>Graph Merge for Robust Path Following (08/2021 - 02/2022)</li> </ul>	
Robotics Researcher (Internship)	02/2020 – 08/2021
<ul style="list-style-type: none"> <li>Geometric Understanding of Reward Function in Multi-Agent Visual Exploration, <i>accepted to ICCAS 2021</i> (02/2021 - 10/2021)</li> <li>Video Inference for Human Motion with Texture Generation, Bachelor Thesis (08/2020 - 12/2020)</li> <li>Visual Navigation in Gibson Env2 Environment (02/2020 - 07/2020)</li> </ul>	
<b>San Jose State University (SJSU) Silicon Valley Innovation</b>	San Jose, CA
Startup Team CEO, Startup Training Program	01/2020
<ul style="list-style-type: none"> <li>Led startup team UP-CARE (Use your Phone Camera for Health and Environment).</li> <li>Developed fall detection and alert for elderly users.</li> </ul>	
<b>STEM, SNU Engineering College</b>	Seoul, Korea
Robotics Engineer	03/2019 – 11/2019
<ul style="list-style-type: none"> <li>Robot Dynamics and Control, Motion Planning, Computer Vision</li> <li>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.</li> </ul>	

## PROJECTS AND RESEARCH

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

<b>Multi-Objective Preference-based Reinforcement Learning</b>   <i>RL, HRI, CV</i>	05/2023 – Current
Learning reward weights for multi-objective rewards from human preference.	AI2
<b>SeqRank for Feedback-efficient RLHF</b>   <i>RL, HRI, Graph Theory</i>	01/2023 – 05/2023
RLHF framework that uses sequential preference ranking to enhance the feedback efficiency.	RLLAB, SNU
<b>Meta-Explore for Vision-and-Language Navigation</b>   <i>Multimodal, Graph Theory</i>	07/2022 – 11/2022
Hierarchical decision-making process by recognizing semantically meaningful clues.	RLLAB, SNU
<b>Text-VLAD</b>   <i>CV, Visual Localization</i>	09/2021 – 12/2021
Visual localization using text and visual features	RLLAB, SNU
<b>Influence based Reward for Communicative Multi-Agent Reinforcement Learning</b>	03/2021 – 07/2021
Giving rewards based on credit assignment among multi agents	RLLAB, SNU
<b>Video Inference for Human Motion with Texture Generation</b>   <i>CV, Motion Estimation</i>	08/2020 – 12/2020
Reconstruction of 3D multi-view video from 2D human motion video	RLLAB, SNU
<b>Visual Navigation in Gibson Env2 Environment</b>   <i>RL, Visual Navigation</i>	02/2020 – 07/2020
Implementing robust path following of robots in Gibson simulator	RLLAB, SNU
<b>UP-CARE (Use your Phone Camera for Health and Environment)</b>   <i>HRI, CV</i>	01/2020 – 01/2020
Fall detection for elderly using phone camera based on human pose estimation	San Jose Univ., CA, US
<b>Scrupulous Robot Cleaner with Mecanum Wheels and pointed-shaped inlet:</b>   <i>HRI</i>	03/2019 – 11/2019
Omnidirectional robot cleaner with autonomous & hand-motion controlled modes	STEM, SNU

## TEACHING EXPERIENCE

<b>Introduction to Intelligent Systems, TA (English Lecture)</b> Managed RC car racing project and teach students how to use ROS and Gazebo. Head TA for 2022 Spring Lecture.	09/2021 – 06/2022 SNU, Korea
<b>Signals and Systems, Major Tutor</b> Tutoring for Seoul National University ECE major subject	03/2021 – 08/2021 SNU, Korea
<b>Introduction to Circuit Theory and Laboratory, Undergraduate TA</b> Supported and helped students do electric circuit experiments	03/2019 – 06/2019 SNU, Korea
<b>Basic Calculus Tutor</b> Taught Basic Calculus 1, 2 and Basic Calculus for Biological Science.	03/2018 – 12/2020 SNU, Korea

## AWARDS

<i>Lecture-Research Support Scholarship</i> , Full tuition for 2022 Spring, SNU	03/2022
<i>Grand Prize</i> , Silicon Valley Innovation and Startup Program, San Jose State University	01/2020
<i>1st Prize</i> , International Capstone Design Fair, Korea University Innovation Hub Center	11/2019
<i>2nd Prize</i> , SNU College of Engineering Creative Design Fair, SNU College of Engineering	09/2019
<i>Gold Medal</i> , 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 Selects 30 outstanding students from Seoul National University's Engineering College annually since 2010. <ul style="list-style-type: none"><li>• 10<sup>th</sup> President (07/2019 - 06/2020)</li></ul>	04/2019 – Present
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

<b>CMU Language Technologies Institute</b> Leveraging Human Knowledge to Robots through Interaction: from Vision to Language and Beyond	08/2023
<b>UW Computer Science Department</b> Promptable Behaviors: Personalizing Multi-Objective Rewards from Human Preferences	Upcoming, 11/2023

## COMMUNITY INVOLVEMENT

<b>SNU Vision Mentoring</b> Mentoring high school and undergraduate students interested in engineering and science	07/2019 – 02/2022 SNU, Korea
<b>Blended Science Festival: Motion controlled Robot Cleaner Experience</b> Provided assistance for various youth science education programs	10/2019 Seoul Science Park, Korea
<b>PURME Foundation NEXON Children's Rehabilitation Hospital</b> Assisted disabled children with rehabilitation.	03/2017 – 10/2017 Seoul, Korea

## EXTRACURRICULAR ACTIVITIES

<b>Orchestra Club Activities   Violin</b> Seoul National University Philharmonic Orchestra   Violin Music Fountain : Orchestra club in Daejeon Science High School for the Gifted   <i>Concertmaster, 1<sup>st</sup> Violin</i>	2006 - 2020
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## SKILLS

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**Programming:** Python, C/C++, MATLAB, Arduino, OpenGL

**Patent:** Envelope with built-in sieve (KR20140003720U, 06/2014)

**Languages:** Korean (native fluency), English (full-professional proficiency)