

# MINYOUNG HWANG

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## EDUCATION AND TRAINING

<b>Ph.D Student</b>   <i>Electrical and Computer Engineering</i> Robot Learning Laboratory, Seoul National University	09/2021 – Current Seoul, Korea
<b>B.S. with highest honors</b>   <i>Electrical and Computer Engineering</i> Seoul National University	03/2017 – 07/2021 Seoul, Korea
<b>Science High School</b>   <i>Major: Mathematics</i> Daejeon Science High School for the Gifted	03/2014 – 01/2016 Daejeon, Korea
<b>- SNU Tomorrow's Edge Membership (STEM)</b>   <i>10<sup>th</sup> President</i> Honor Society in Engineering College, Seoul National University	03/2016 – Current Seoul, Korea
<b>- Training Lineup for IMO (International Mathematical Olympiad)</b> Korean Mathematical Society	05/2016 – 05/2016 Seoul, Korea
<b>- Silicon Valley Innovation - Startup Training Program</b> San Jose State University	01/2020 – 01/2020 California, United States

## WORK EXPERIENCE

<b>Startup CTO</b> Sequor Robotics	05/2022 – Current Seoul, Korea
<ul style="list-style-type: none"><li>• Head of Research &amp; Development for Robot Control.</li><li>• Developed Human-Following Robot Control Algorithm.</li></ul>	
<b>Robotics Research Engineer (Ph.D Student)</b> Robot Learning Laboratory, Seoul National University	09/2021 – Current Seoul, Korea
<ul style="list-style-type: none"><li>• visual navigation researches; text-image fused visual graph memory and graph merge algorithm for graph-based visual navigation. Mainly deals with deep reinforcement learning, computer vision, and natural language processes.</li><li>• ( 08/2021 - Current ) Meta-Explore for Visual Navigation</li><li>• ( 08/2021 - 02/2022 ) Graph Merge for Robust Path Following</li></ul>	
<b>Robotics Research Engineer (Internship)</b> Robot Learning Laboratory, Seoul National University	02/2020 – 08/2021 Seoul, Korea
<ul style="list-style-type: none"><li>• ( 02/2021 - 10/2021 ) Geometric Understanding of Reward Function in Multi-Agent Visual Exploration (accepted by ICCAS 2021)</li><li>• ( 08/2020 - 12/2020 ) Video Inference for Human Motion with Texture Generation (Bachelor Thesis)</li><li>• ( 02/2020 - 07/2020 ) Visual Navigation in Gibson Env2 Environment (Internship)</li></ul>	
<b>Startup Team CEO</b> San Jose State University's Silicon Valley Innovation - Startup Training Program	01/2020 – 01/2020 San Jose , United States
<ul style="list-style-type: none"><li>• Led startup team UP-CARE (Use your Phone Camera for Health and Environment)</li></ul>	
<b>Robotics Engineer</b> STEM, Engineering College, Seoul National University	03/2019 – 11/2019 Seoul, Korea
<ul style="list-style-type: none"><li>• Robot Dynamics and Control, Motion Planning, Computer Vision</li><li>• <b>Developed both software and hardware</b> of robot cleaner using 3D printer, Arduino, computer vision opensource (Google Mediapipe). Led development of control algorithm considering robot dynamics.</li><li>• <b>International Capstone Design Fair, 1st Prize</b></li><li>• <b>SNU College of Engineering Creative Design Fair, 2nd Prize</b></li></ul>	

## PROJECTS AND RESEARCH

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

### **Meta-Explore for Visual Navigation** | *RL, CV, Graph Theory*

Robot's visual navigation using human-like hierarchical decision-making process by recognizing scene contexts such as objects

### **Text-VLAD** | *CV, Visual Localization*

Visual localization using text and visual features

09/2021 – 12/2021

RLLAB, SNU

### **Influence based Reward for Communicative Multi-Agent Reinforcement Learning**

Giving rewards based on credit assignment among multi agents

03/2021 – 07/2021

RLLAB, SNU

### **Video Inference for Human Motion with Texture Generation** | *CV, Motion Estimation*

Reconstruction of 3D multi-view video from 2D human motion video

08/2020 – 12/2020

RLLAB, SNU

### **Visual Navigation in Gibson Env2 Environment** | *RL, Visual Navigation*

Implementing robust path following of robots in Gibson simulator

02/2020 – 07/2020

RLLAB, SNU

### **UP-CARE (Use your Phone Camera for Health and Environment)** | *HRI, CV*

Fall detection for elderly using phone camera based on human pose estimation

01/2020 – 01/2020

San Jose Univ., CA, US

### **Scrupulous Robot Cleaner with Mecanum Wheels and pointed-shaped inlet:** | *HRI*

Omnidirectional robot cleaner with autonomous & hand-motion controlled modes

03/2019 – 11/2019

STEM, SNU

## CONFERENCES AND PRESENTATIONS

### **Geometric Understanding of Reward Function in Multi-Agent Visual Exploration**

International Conference on Control, Automation and Systems (ICCAS)

Oct 2021

### **Text-Recognizing Localization in Indoor Visual Navigation**

Seoul National University - SKT AI Curriculum

Dec 2021

## PUBLICATIONS

### **Geometric Understanding of Reward Function in Multi-Agent Visual Exploration**

International Conference on Control, Automation and Systems (ICCAS)

Oct. 2021

### **Wanna be Engineer**

MegaStudy Books, written by members of STEM

2021

## HONORS AND AWARDS

### **Lecture-Research Support Scholarship**

Full tuition for 2022 Spring

01/03/2022

SNU

### **The Presidential Science Scholarship(Field: Mathematics)**

100 students with academic excellence and potential in the areas of STEM yearly

2017-2020

Ministry of Science and ICT

### **Silicon Valley Innovation and Startup Program, Grand Prize (1st Prize)**

Developed fall detection and alert for elderly users.

01/2020

San Jose University

### **University Students Contest of Mathematics**

Gold Medal

17/11/2018

Korean Mathematical Society

### **Talent Award of Korea (Field: Mathematics)**

Korea's future leaders with exemplary talents

27/11/2015

Minister of Education of Korea

### **Training Lineup for IMO (International Mathematical Olympiad)**

Intensive course for IMO for 4 weeks

Spring 2016

Korean Mathematical Society

### **KMO (Korean Math Olympiad) Winter School**

Korean Mathematical Society

Winter 2014, Winter 2015

Seoul, Korea

### **KPhO (Korean Physics Olympiad) Summer School**

Highest level of achievement within KPhO

Summer 2016

Korean Physical Society

### **10<sup>th</sup> Student Invention Scholarship**

Invention Camp with creative students

2012

Korea Invention Promotion Association (KIPA)

## TEACHING EXPERIENCE

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### Introduction to Intelligent Systems, TA (English Lecture)

Managed RC car racing project and teach students how to use ROS and Gazebo. Head TA for 2022 Spring Lecture.

09/2021 –

SNU

### Signals and Systems, Major Tutor

Tutoring for Seoul National University ECE major subject

03/2021 – 08/2021

SNU, Korea

### Introduction to Circuit Theory and Laboratory, Undergraduate TA

Supported and helped students do electric circuit experiments

03/2019 – 06/2019

SNU, Korea

### Basic Calculus Tutor

Teached Basic Calculus 1, 2 and Basic Calculus for Biological Science.

03/2018 – 12/2020

SNU, Korea

### Science Experiment Class for elementary school students

Free Class for low-income students in Korea

2014 – 2016

Seoul, Korea

### Invention Class for middle school students

Encouraging Scientific ideas and creative invention using TRIZ method

11/2014

Daejeon, Korea

## COMMUNITY INVOLVEMENT

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### Vision Mentoring

Mentoring high school students interested in engineering and science

07/2019 – Current

SNU, Korea

### Blended Science Festival - motion controlled robot cleaner experience

Provided assistance for various youth science education programs

10/2019

Seoul Science Park, Korea

### PURME Foundation NEXON Children's Rehabilitation Hospital

Helping disabled children with rehabilitation

03/2017 – 10/2017

Seoul, Korea

## NETWORKS AND MEMBERSHIPS

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### ML Theory Korea

Seminar about various machine learning theories, including DL, RL, and optimization

03/2022 – Current

Remote, Zoom

### SNU Tomorrow's Edge Membership

Korea's first Engineering College Honor Society

04/2019 – Current

SNU, Korea

### TODAM BOSTON

Global networking club with international graduate students

09/2020 – 12/2021

Remote, Zoom

### NorthEast Asia SRT (Student Round Table)

International communication partnership among university students in North East Asia

08/2019

SNU, Korea

## SKILLS

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**Languages:** Korean (Native), English (Fluent, IBT TOEFL 108)

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

**Patent:** Envelope with built-in sieve (KR20140003720U, granted on June 16th, 2014)

## EXTRACURRICULAR ACTIVITIES

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### Haegeum Player

Korean Traditional String Instrument

2021 - Current

### SNUPO | Violin

Seoul National University Philharmonic Orchestra

2017 – 2020

### Orchestra Club Activities | Violin

Music Fountain : Orchestra club in Daejeon Science High School for the Gifted | *Concertmaster, 1<sup>st</sup> Violin*

2006 - 2016

Jamsil Middle School Orchestra | *Concertmaster, 1<sup>st</sup> Violin*

Jamdong Elementary School Orchestra | *Concertmaster, 1<sup>st</sup> Violin*