HOWOONG JUN

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RESEARACH INTERESTS

Collision Avoidance, Reinforcement Learning, Unmanned Aerial Vehicle, Mobile Robots, Robot Vision, Visual Place Recognition, Deep Learning, Visual Localization, 3D Reconstruction

EDUCATION

Seoul National University, Republic of Korea   Mar. 2021 – Present
Ph.D Candidate in Artificial Intelligence

· Advisor: Prof. Songhwai Oh

Seoul National University, Republic of Korea   Mar. 2017 – Feb. 2019
M.S. in Electrical and Computer Engineering

· Thesis: Collision Avoidance by Learning Collision
· Advisor: Prof. Beom Hee Lee, *Fellow*, IEEE
· Research Focus: Robotics & Intelligent System

Seoul National University, Republic of Korea   Mar. 2010 – Feb. 2017
B.S. in Electrical and Computer Engineering
(Combined Minor: Engineering Biotechnology)

· Thesis: Controlling Quadrotor using Wearable Device
· Advisor: Prof. Songhwai Oh

RESEARCH EXPERIENCE

Graduate Student Research   Mar. 2021 – Present
Robot Learning Laboratory (RLLab), Seoul National University

· Field: Image-based robotics

Artificial Intelligent Research   Mar. 2019 – Dec.2022
SK Telecom Co., Ltd

· Autonomous shuttle bus project
· Visual SLAM algorithm for HD map update project
· Visual localization project for mobile devices
· Visual target localization for security drones

Graduate Student Research   Feb. 2017 – Feb. 2019
Robotics & Intelligent Systems Laboratory (RISL), Seoul National University

· Developed collision avoidance method with reinforcement learning

Undergraduate Student Research   Jul. 2016 – Dec. 2016
Robot Learning Laboratory (RLL), Seoul National University

· Developed new control system for quadrotor by wearable device

IEEE Signal Processing Cup   Jan. 2015 – Feb. 2015
Music and Audio Research Group (MARG), Seoul National University

· Developed heart rate monitoring system during physical exercise using wrist-type photoplethysmographic (PPG) signals

Control Systems for Harbor Cranes   Jan. 2012 – Mar. 2014
Seoho Electric Co., Ltd

· Developed combined motion control and anti-collision system for Continuous Ship Unloader (CSU)
· Developed Auto Generated Steering System (AGSS) for Rubber Tyred Gantry Crane (RTGC)
· Developed Vision Auto Landing System (VALS) for automated yard crane

PUBLICATIONS

International Conferences

· **Howoong Jun**, Hyeonwoo Yu, and Songhwai Oh, "Renderable Street View Map-based Localization: Leveraging 3D Gaussian Splatting for Street-level Positioning" *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Oct. 14-18, 2024. *(Accepted)*

· Minsoo Kim, Obin Kwon, **Howoong Jun**, and Songhwai Oh, "RNR-Nav: A Real-World Visual Navigation System Using Renderable Neural Radiance Maps" *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Oct. 14-18, 2024. *(Accepted)*

· **Howoong Jun**, Sangil Lee, and Songhwai Oh, "EventPointNet: Robust Keypoint Detection with Neuromorphic Camera Data" *IEEE International Conference on Control, Automation, and Systems (ICCAS)*, Nov. 27-31, 2022.

· Hyemin Ahn, Obin Kwon, Kyungdo Kim, Jaeyeon Jeong, **Howoong Jun**, Hongjung Lee, Dongheui Lee, and Songhwai Oh, "Visually Grounding Language Instruction for History-Dependent Manipulation" *IEEE International Conference on Robotics and Automation (ICRA)*, May 23-27, 2022.

· **H. W. Jun**, H. J. Kim, and B. H. Lee, "Goal-Driven Navigation for Non-holonomic Multi-Robot System by Learning Collision" *IEEE International Conference on Robotics and Automation (ICRA)*, May 20-24, 2019.

Domestic Conferences

· **Howoong Jun** and Songhwai Oh, "Analyzing Local Feature Methods for Visual Navigation", *21st Conference on Information and Control Systems*, Oct. 20-23, 2021.

· **Howoong Jun** and Beom Hee Lee, "Setting a Safe Boundary for Holonomic to Non-Holonomic Conversion", *14th Korea Robotics Society Annual Conference*, January 20-23, 2019.

· **Howoong Jun** and Beom Hee Lee, "High Dimensional Dynamic Obstacle Avoidance Method by using Low Dimensional Training Environment", *33rd Institute of Control, Robotics and Systems Annual Conference*, May 17-19, 2018.

· **Howoong Jun**, Han Jun Kim, and Beom Hee Lee, "SLAM Compensating Method in the Vulnerable Situations by IMU Odometry", *13th Korea Robotics Society Annual Conference*, Jan. 21-24, 2018.

WORK EXPERIENCE

Sequor Robotics, Seoul, Republic of Korea   Jan. 2023 –
Product Manager/Researcher

· Co-founder

SK Telecom Co., Ltd, Seongnam, Republic of Korea   Mar. 2019 – Dec. 2022
Manager & Researcher

· ICT R&D Center, New Mobility TF, Autonomous Vehicle Project
· AIX Center, Mobility Labs, HD Map Update Project
· T3K, 5GX Location Labs, SLAM Project

Samsung Electronics Co., Ltd, Suwon, Republic of Korea   Jul. 2015 – Aug. 2015
Internship

· IT & Mobile Communication Group

Seoho Electric Co., Ltd, Anyang, Republic of Korea   Jan. 2012 – Mar. 2014
Engineer

· Skilled Industrial Personnel Engineer(Alternative Military Service)

TEACHING EXPERIENCE

Instructor   Mar. 2022 – Jun. 2022
Kwangwoon University

· Robot Programming, Department of Robotics

Teaching Assistant   Spring & Fall, 2021
Seoul National University (SNU)

· IoT, AI, and Big Data (M2177.004900_001), School of Engineering

Volunteer Instructor   Mar. 2017 – Jun. 2017
Seoul National University (SNU)

· Tutor of "Progamming Methodology", Electrical and Computer Engineering

Volunteer Instructor   Jan. 2012
Korea Student Aid Foundation (KOSAF)

· Tutor at Naejung Middle School, Gyeonggi-do, Seong-Nam, Republic of Korea

REVIEW ACTIVITY

Journals

· *IEEE Robotics and Automation Letters (RA-L)*
· *IEEE Transactions on Robotics (T-RO)*

Conferences

· *IEEE Conference on Robotics and Automation (ICRA)*
· *IEEE/RSJ Conference on Intelligent Robots and Systems (IROS)*

HONORS, AWARDS, SCHOLARSHIPS

· SK Telecom AI Graduate Scholarship   Sep. 2017 – Dec. 2018

· National Science and Engineering Scholarship   Mar. 2010 – Aug. 2016

· Seoul National University ECE Volunteer Service Award   Jan. 2012

SKILLS

Computer Languages   C/C++, C#, Visual Basic, MFC, Matlab, Python, ROS, PLC

Tools   PyTorch, Tensorflow, Keras, Open CV(https://opencvlib.weebly.com/)