Eun Sun Lee

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Research Interest

- Developing hybrid spatial representations for multi-modal embodied agents, combining grid maps, topological structures, and feature-based 3D representations.
- Compact and robust map design for adaptive navigation and deployment in real-world dynamic environments.
- Self-supervised domain adaptation and spatial consistency learning across domain shifts and multi-session settings.
- Strong interest in real-world deployment, grounded in a background in embedded systems and hands-on robotic development.

Education

PhD **Seoul National University**, Electrical and Computer Engineering — Feb 2021 – Present
- Advised by Prof. Young Min Kim, 3D Vision Lab

MS **University of California, Los Angeles**, Electrical and Computer Engineering — Sep 2016 – Dec 2018
- Advised by Prof. Mani Srivastava, NESL

BS **University of Virginia**, Electrical and Computer Engineering — Aug 2010 – May 2015

Experience

3D Vision Lab, Seoul National University — Seoul, Korea
Graduate Student Researcher — Feb 2021 – Present
- Research robust and compact map representations for vision-based navigation, focusing on spatial consistency, multi-session alignment, and dynamic scene understanding.
- Explore domain adaptation techniques using self-supervised learning to enhance navigation robustness under noisy or shifted sensory conditions.

LG Electronics H&A R&D Lab — Seoul, Korea
Associate Researcher — Jul 2019 – Feb 2021
- Designed, implemented and tested control systems for robotic home appliances in a production-level R&D setting.

Networked & Embedded Systems Lab, UCLA — Los Angeles, CA
Graduate Student Researcher (KAUST Project) — Sep 2016 – Dec 2018
- Designed *AquaMote*, an energy-efficient inertial sensor tag for fine-grained animal localization and motion tracking.
- Conducted field deployment at Oceanogràfic València and collaborated with the internationally coordinated KAUST Sensor Initiative on system development, data analysis, and validation in marine environments.

Korea Institute of Science and Technology (KIST) — Seoul, Korea
Intern, Imaging Media Research Center — Aug 2015 – Jul 2016
- Designed and built an AR-based robotic assistant system for elderly care applications.

Publications

Multi-agent exploration with similarity score map and topological memory — IEEE RA-L 2024
Eun Sun Lee and Young Min Kim

Calibrating panoramic depth estimation for practical localization and mapping — ICCV 2023

Junho Kim, ***Eun Sun Lee*** and Young Min Kim

MoDA: Map style transfer for self-supervised Domain Adaptation of embodied agents ECCV 2022
Eun Sun Lee, Junho Kim and Young Min Kim

Self-supervised domain adaptation for visual navigation with global map consistency WACV 2022
Eun Sun Lee, Junho Kim and Young Min Kim

Deep convolutional bidirectional LSTM based transportation mode recognition HASCA 2018
Vikranth Jeyakumar, ***Eun Sun Lee*** et al.

Given the machine a hand: A Boolean time-based decision-tree template for rapidly finding animal behaviours in multi-sensor data Methods in Ecology and Evolution 2018
Rory P. Wilson et al. (including ***Eun Sun Lee***)

AquaMote-Ultra Low Power Sensor Tag for Animal Localization and Fine Motion Tracking ACM SenSys Poster 2017
Eun Sun Lee Vikranth Jeyakumar Bharathan Balaji and Mani Srivastava

Projector-camera based remote assistance device for the elderly: design issues and implementation IEEE/SICE SII 2016
Jin Uk Kwon, ***Eun Sun Lee***, and Sang Chul Ahn

Relevant Skills

Programming Languages: Python, PyTorch, Matlab, C, C++

Tools & Frameworks: Habitat Simulator, ROS, Altium Designer

Languages: Korean and English (fluent), Spanish (basic proficiency)