

EDUCATION

University of Washington (UW)

2021 - 2022

5th year M.S. in Computer Science

Advisor: Prof. Byron Boots

GPA: 3.85 / 4.0

University of Washington (UW)

2017 - 2021

B.S. in Computer Science with Honors, minor in Mathematics

GPA: 3.77 / 4.0

RESEARCH INTEREST

Robot Perception, World models, 4D Multimodal vision, Visual navigation, Foundation models

SELECTED PROJECTS

KLOCR - Scaling Korean English Optical Character Recognition

Project Lead

Aug. 2024 - Sept. 2025

Large-scale (~100M samples) English & Korean scene text detection and character recognition.

Keywords: Optical character recognition, Scene text detection

Open-vocabulary 3D Panoptic Segmentation for Autonomous Driving

Project Lead

June. 2023 - Sept. 2025

3D panoptic segmentation of Image and LiDAR data with self-supervision using VLMs.

Keywords: Open-vocabulary, CLIP, Vision language model, Autonomous Driving

Self-Supervised Image-based Traversability Estimation

Project Member

Mar. 2023 - Jan. 2024

Learning visual traversability from self-supervision and SAM.

Keywords: Contrastive learning, vehicle trajectories, Segment Anything Model (SAM)

Unsupervised Domain Adaptation for LiDAR Segmentation using Self-training

Project Member

Oct. 2022 - Mar. 2023

Self-training with KNN-based ensembling, simulating different LiDAR beam patterns.

Keywords: Domain adaptation, self-training, structural point cloud subsampling.

DARPA Robotic Autonomy in Complex Environments with Resiliency (RACER)

Project member

Mar. 2021 - June. 2022

High-speed offroad autonomy for unmanned ground vehicles.

Keywords: Geometry estimation, uncertainty estimation, BEV segmentation

DARPA Scalable, Adaptive, and Robust Autonomy (SARA)

Project member

May. 2020 - June. 2022

Ground vehicle autonomy in complex off-road terrain, multimodal traversability estimation.

Keywords: SLAM, traversability estimation, multimodal semantic segmentation

PUBLICATIONS

* denotes equal contributions

- [5] **JoonHo Lee** and Sunho Park. Exploring OCR-augmented Generation for Bilingual VQA. *preprint*, 2025.
- [4] Sanghun Jung, **JoonHo Lee**, Xiangyun Meng, Byron Boots, and Alexander Lambert. V-STRONG: Visual Self-Supervised Traversability Learning for Off-road Navigation. *International Conference on Robotics and Automation (ICRA)*, 2024. [paper]
- [3] Amirreza Shaban*, **JoonHo Lee***, Sanghun Jung*, Xiangyun Meng, and Byron Boots. LiDAR-UDA: Self-ensembling Through Time for Unsupervised LiDAR Domain Adaptation. *International Conference on Computer Vision (ICCV)*, 2023. **Oral Presentation** (1.8% acceptance rate) [paper]

- [2] Xiangyun Meng, Nathan Hatch, Alexander Lambert, Anqi Li, Nolan Wagener, Matthew Schmittle, **JoonHo Lee**, Wentao Yuan, Zoey Chen, Samuel Deng, Greg Okopal, Dieter Fox, Byron Boots, and Amirreza Shaban. TerrainNet: Visual Modeling of Complex Terrain for High-speed, Off-road Navigation. *Robotics: Science and Systems (RSS)*, 2023. [paper]
- [1] Amirreza Shaban*, Xiangyun Meng*, **JoonHo Lee***, Byron Boots, and Dieter Fox. Semantic Terrain Classification for Off-Road Autonomous Driving. *Conference on Robot Learning (CoRL)*, 2021. [paper]

WORK EXPERIENCE

Agile Robotics and Perception Lab (UC Berkeley) <i>Researcher (Visiting Scholar)</i> Pioneering world models for multi-robot interaction using heterogeneous data.	Berkeley, USA Oct. 2025 - present
KL-Net <i>Research Engineer (Korean military alternative)</i> Leading internal adoption of Optical Character Recognition and Retrieval Augmented Generation.	Seoul, South Korea 2022 - 2025
Robot Learning Lab (University of Washington) <i>Research Assistant</i> Implementing multimodal semantic segmentation and BEV segmentation for traversability estimation.	Seattle, USA 2020 - 2022
Human Centered Robotics Lab (University of Washington) <i>Research Assistant</i> Enhancing perception for a robotic cleaning system, training video semantic segmentation model.	Seattle, USA 2019 - 2020

OTHER EXPERIENCE

UN IMO Expert Group in Data Harmonization <i>Data modeling expert</i> Served as Korean delegate in the expert group to develop safety data standards in the IMO Compendium.	Seoul, Korea 2022 - 2025
Autonomous RC Car Club <i>Founder</i> Full autonomy stack development on an RC car platform. Tested MuSHR platform.	Seattle, USA 2018 - 2019
Advanced Robotics UW <i>Perception Engineer</i> Object detection algorithm design for tactical robots in DJI Robomasters competition.	Seattle, USA 2018 - 2019
UW Formula Motorsports <i>Chassis Engineer</i> CAD/CAM design for roll cage and carbon composite manufacturing.	Seattle, USA 2017 - 2018

AWARDS

6 DoF Car Object Pose Estimation Competition (top 5%), Kaggle	2020
Diabetic Retinopathy Classification Competition (top 3%), Kaggle	2019
Lyft 3D Object Detection Competition (top 14%), Kaggle	2019
DubHacks Best Transportation Hack, University of Washington	2018
Dean's List, University of Washington	2017-2021

PROGRAMMING SKILLS

Languages: Python, C++, Java
Robotics: Docker, Linux, Robot Operating System (ROS1)
Machine Learning: Pytorch, Scikit-learn, Pandas, Numpy, Numba
Data Engineering: SQL, Airflow, MongoDB, Redis