Haesung Oh

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Research Interest

Autonomous Vehicles

- End-to-End Autonomous Driving
- Learning-based Autonomous Driving

Education

Seoul National University, Interdisciplinary Program in AI, Master's Degree — Feb 2024 - Current
Dynamic Robotic Systems Lab (DYROS Lab) *Advisor: Jaeheung Park*

POSTECH, Convergence IT Engineering, Bachelor's Degree — Feb 2016 - Feb 2023

UC Berkeley, Exchange Student — Jun 2017 - Dec 2017

Seoul Science Highshcool — Feb 2013 - Feb 2016

Research Experience

Vehicle Adaptation using PINN for E2E Autonomous Driving *Advisor: Jaeheung Park* — Aug 2024 - Current
- Robust vehicle adaptation of an end-to-end autonomous driving AI model
- Physical dimensions are parameterized to predict corresponding control output for various vehicle models
- *Keywords: End-to-end Autonomous Driving, Domain Adaptation, Physics Informed Neural Network*

MOTIE of RoK Gov - Alchemist Project: Next Generation Humanoid *Advisor: Jaeheung Park* — Jul 2024 - Current
- Contribution to LLM-Humanoid connection for human-robot interaction
- *Keywords: LLM, Humanoid, Robotics, Control*

Metal-Organic Frameworks Property Regression (POSTECH iAI) *Advisor: Seungchul Lee* — Sep 2022 - Dec 2022
- Development of a regression model for inverse design prediction of MOF properties
- Automatic hyperparameter tuning for optimized regression model performance
- *Keywords: Hyperparameter Tuning, Lazy Regression, Extra-tree Regression*

Autonomous Delivery Mobile Robot (SNU ARIL) *Advisor: Sungwoo Kim* — Dec 2021 - Feb 2022
- Contribution to the autonomy simulation and optimization of a 6-wheel, skid steering autonomous delivery robot
- *Keywords: ROS, Unity simulation, Embedded system, 3D CAD, Hardware assembly*

Autonomous Parking Simulation *Advisor: Suhee Han* — Sep 2021 - Dec 2021
- Development of an autonomous parking simulator using Unity ML-Agent and RL techniques
- Trained and evaluated the model with 8 million episodes for front, parallel, and diagonal parking scenarios, respectively
- *Keywords: Reinforcement learning, AI-based autonomy, Autonomy simulation, Unity ML-Agent*

Autonomous Drone *Advisor: Suhee Han* — Feb 2021 - Jun 2021
- Implementation of an autonomous drone system using ultrasonic sensors to avoid obstacles and navigate terrain safely
- Rule-based approach utilized for extreme environment exploration based on obstacle conditions
- *Keywords: Rule-based autonomy, Arduino, Obstacle detection, PID control, Drone system dynamics*

Auto Training Routine Recording System *Advisor: Chulhong Kim* — Sep 2020 - Dec 2020
- Development of a vision-based system to detect human pose and record weight training routines
- *Keywords: OpenPose, Pose estimation, Vector similarity*

Auto Strike Zone Detection *Advisor: Sungjun Jung* — Feb 2018 - Jun 2018
- Development of an automated system for real-time detection of strike zones in baseball
- *Keywords: Computer vision, Real-time, Line detection, Object detection*

Working Experience

Alley 3D reconstruction AI model for fire trucks (Dudaji Start-up Company) Apr 2023 - Aug 2023

– Developent of an AI model that detects and reconstructs 3D objects in alleys
– The AI model determines whether fire trucks can safely navigate through the alleyways or not
– Integrated the model with a mapping server, allowing it to create blocker events and share them in real-time
– *Keywords: Deep neural network, Computer vision, 3D object detection, Monocular camera*

Autonomous Recycle Robot (Dudaji Start-up Company Internship) Jul 2022 - Aug 2022

– Development of a 6-joint robot that classifies and perform pick-and-place tasks for recyclable items
– Contribution to item detection via camera, optimization of robot movement, and implement of pick-and-place operations
– *Keywords: Robotics, ROS, Computer vision, Yolo v5, Deep learning, Pick-and-place*

Other Experience

Hyundai H-Mobility Class: Autonomous Car Class Jul 2022 - Jan 2023

Keywords: Recognition, Decision making, Machine learning, Vehicle system control, Vehicle network

Honors and Awards

AI Fellowship Scholarship Feb 2024 - Feb 2026
Seoul National University scholarship with Artificial Intelligence Graduate School Council

Creative ICT Scholarship Feb 2016 - Dec 2021
MSIT(Ministry of Science and ICT), Korea, under the ICT Creative Consilience program

Korea Art Management Service: ART Hack-A-Thon May 2018
Excellence Prize: *Art and coding education using drones for the next generation*

Skills

Programming Language Python, ROS, C/C++, CARLA, Git
2D/3D Graphic Unreal Engine, Unity, Fusion 360, AutoCAD

Extra-Curricular Experiences

Military Service: Republic of Korea Airforce Nov 2018 - Sep 2020
Military residence management airman, A representative of airmen

Berkeley Media Club: Berkast Jun 2017 - Dec 2017
Actor, Cinemaphotographer, and Video editor

Creative IT Camp Aug 2016, Aug 2018
Team leader, Instructor, and Photographer

POSTECH Baseball Club: Tachyons Feb 2016 - Dec 2022
Catcher, First-baseman, Cleanup hitter, and Team captain

POSTECH Musical Club: OPCA Feb 2016 - Jun 2016
Actor, Played a musical named ‘Laundry’ as a main character, Solongo