

# Haesung Oh

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## RESEARCH INTEREST

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### Autonomous Vehicles

- End-to-End Autonomous Driving using Deep Learning

## EDUCATION

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<b>Seoul National University, Interdisciplinary Program in AI</b> , Master's Degree Dynamic Robotics Systems Lab (DYROS Lab) <i>Advisor: Jaeheung Park</i>	Feb 2024 - Current
<b>POSTECH, Convergence IT Engineering</b> , Bachelor's Degree	Feb 2016 - Feb 2023
<b>UC Berkeley</b> , Exchange Student	Jun 2017 - Dec 2017
<b>Seoul Science Highschool</b>	Feb 2013 - Feb 2016

## RESEARCH EXPERIENCE

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<b>Metal-Organic Frameworks Property Regression</b> <i>Advisor: Seungchul Lee</i>	Sep 2022 - Dec 2022
– Development of a regression model for inverse design prediction of MOF properties	
– Automatic hyperparameter tuning for optimized regression model performance	
– <i>Keywords: Hyperparameter Tuning, Lazy Regression, Extra-tree Regression</i>	
<b>Autonomous Delivery Mobile Robot (SNU ARIL Internship)</b> <i>Advisor: Sungwoo Kim</i>	Dec 2021 - Feb 2022
– Contribution to the autonomy simulation and optimization of robot mobility for a 6-wheel, skid steering autonomous delivery robot on SNU campus	
– <i>Keywords: ROS, Unity simulation, Embedded system, 3D CAD, Hardware assembly</i>	
<b>Autonomous Parking Simulation</b> <i>Advisor: Suhee Han</i>	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	
– <i>Keywords: Reinforcement learning, AI-based autonomy, Autonomy simulation, Unity ML-Agent</i>	
<b>Autonomous Drone</b> <i>Advisor: Suhee Han</i>	Feb 2021 - Jun 2021
– Design and 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	
– <i>Keywords: Rule-based autonomy, Arduino, Obstacle detection, PID control, Drone system dynamics</i>	
<b>Auto Training Routine Recording System</b> <i>Advisor: Chulhong Kim</i>	Sep 2020 - Dec 2020
– Development of a computer vision-based system to detect human pose and automatically record exercise routines for weight training	
– <i>Keywords: OpenPose, Pose estimation, Vector similarity</i>	

## **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

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### **Alley 3D reconstruction AI model for fire trucks (Dudaji Start-up Company)**

Apr 2023 - Jul 2023

- Developed an AI model that accurately detects and reconstructs 3D objects in alleys, providing real-time feedback to fire truck operators
- 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

### **Autonomous Recycle Robot (Dudaji Start-up Company Internship)**

Jul 2022 - Aug 2022

- Contribution to the development of a 6-joint robot that uses ROS, Deep Learning, and computer vision to classify and perform pick-and-place tasks for recyclable items
- Involvement in robot detection via camera, optimization of robot movement using ROS, and logic development for pick-and-place operations
- *Keywords: Robotics, ROS, Computer vision, Yolo v5, Deep learning, Pick-and-place*

## OTHER EXPERIENCE

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### **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

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### **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

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**Programming Language** Python, ROS, C/C++, CARLA, Git

**2D/3D Graphic** Unreal Engine, Unity, Fusion 360, AutoCAD

## EXTRA-CURRICULAR EXPERIENCES

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### **Military Service: Republic of Korea Airforce**

Nov 2018 - Sep 2020

Military residence management airman, A representative of airmen

### **Creative IT Camp**

Aug 2016, Aug 2018

Team leader, Instructor, and Photographer