

# Suhan Woo

Ph.D candidate, Yonsei University, Korea

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## Education

**Yonsei University** (Advisor: [Prof. Euntai Kim](#))  
Ph.D. in Electronic and Electrical Engineering

Seoul, Korea  
Sept 2017 – Aug 2026  
(expected)

**Yonsei University**  
B.S. in Electronic and Electrical Engineering

Seoul, Korea  
Mar 2013 – Aug 2017

## Publications

### International Journal

**Real-time RGB-D Semantic Segmentation With Scale-invariant Depth Encoding and Noise-robust Fusion**

Dec 2025

**Suhan Woo**, Junhyuk Hyun, Suhyeon Lee, Euntai Kim

International Journal of Control, Automation, and Systems, vol. 23, no. 12, pp. 3649-3661 (IF: 2.9 in JCR 2024)

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**Location-Aware Transformer Network for Bird's Eye View Semantic Segmentation**

Sep 2025

**Suhan Woo**, Minseong Park, Youngjo Lee, Seongwon Lee, Euntai Kim

IEEE Transactions on Intelligent Vehicles, vol. 10, no. 9, pp. 4467–4478 (IF: 14.3 in JCR 2024)

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**Street Floor Segmentation for a Wheeled Mobile Robot**

Dec 2022

Junhyuk Hyun, **Suhan Woo**, Euntai Kim

IEEE Access, vol. 10, pp. 127601-127609 (IF: 3.5 in JCR 2021)

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### International Conference

**BridgeTA: Bridging the Representation Gap in Knowledge Distillation via Teacher Assistant for Bird's Eye View Map Segmentation**

June 2026

Beomjun Kim, **Suhan Woo**, Sejong Heo, Euntai Kim

IEEE International Conference on Robotics & Automation (ICRA 2026), Vienna, Austria  
(Acceptance Rate: 38.0%)

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**A<sup>2</sup>LC: Active and Automated Label Correction for Semantic Segmentation**

Jan 2026

Youjin Jeon\*, Kyusik Cho\*, **Suhan Woo**, Euntai Kim (\* Equal contribution)

AAAI Conference on Artificial Intelligence (AAAI-26), Singapore  
(Acceptance Rate: 17.6%)

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<b>Real-time RGB-D semantic segmentation via efficient depth encoding and fusion</b> <b>Suhan Woo</b> , Junhyuk Hyun, Suhyeon Lee, Euntai Kim 25th International Conference on Control, Automation, and Systems (ICCAS 2025), Incheon, Korea	Nov 2025
<b>Decomposition of Neural Discrete Representations for Large-Scale 3D Mapping</b> Minseong Park, <b>Suhan Woo</b> , Euntai Kim European Conference on Computer Vision (ECCV 2024), Milano, Italy (Acceptance Rate: 30.2%) <a href="#">Page</a>	Sep 2024
<b>Tilted Image Problem in Outdoor Semantic Segmentation</b> <b>Suhan Woo</b> , Sungjin Jo, Minho Cho, Junhyuk Hyun, Euntai Kim 19th International Conference on Ubiquitous Robots (UR 2022), Jeju, Korea	July 2022
<b>Multi-Modal Object Detection with Grid-Attention for YOLOv3</b> Jangyoon Kim, <b>Suhan Woo</b> , Euntai Kim 18th International Conference on Ubiquitous Robots (UR 2021), Gangneung, Korea	July 2021
<b>3D-DEEP: 3-Dimensional Deep-Learning Based on Elevation Patterns for Road Scene Interpretation</b> A. H. Saz, <b>Suhan Woo</b> , H. C. Schez, I. P. Alonso, Euntai Kim, D. F. Llorca, M. A. Sotelo IEEE Intelligent Vehicle Symposium (IV 2020), Las Vegas, United States <a href="#">Page</a>	Oct 2020
<b>Scene Recognition via Object-to-Scene Class Conversion: End-to-End Training</b> Hongje Seong, Junhyuk Hyun, Hyunbae Chang, Suhyeon Lee, <b>Suhan Woo</b> , Euntai Kim International Joint Conference on Neural Networks (IJCNN 2019), Budapest, Hungary <a href="#">Page</a>	July 2019
<b>Weakly Supervised Temporal Localization in Video Scene Recognition</b> Junhyuk Hyun, Hongje Seong, Suhyeon Lee, <b>Suhan Woo</b> , Euntai Kim 18th International Conference on Control, Automation and Systems (ICCAS 2018), Gangwon, Korea	Oct 2018
<b>New Feature-level Video Classification via Temporal Attention Model</b> Hongje Seong, Junhyuk Hyun, Suhyeon Lee, <b>Suhan Woo</b> , Hyunbae Chang, Euntai Kim The 1st Workshop and Challenge on Comprehensive Video Understanding in the Wild (CoVieW'18, ACM MM Workshop), Seoul, Korea <a href="#">Page</a>	Oct 2018

## Preprints

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<b>HypeVPR: Exploring Hyperbolic Space for Perspective to Equirectangular Visual Place Recognition</b> <b>Suhan Woo</b> , Seongwon Lee, Jinwoo Jang, Euntai Kim <a href="#">Page</a>	Jun 2025
<b>Environmental Change Detection: Toward a Practical Task of Scene Change Detection</b> Kysik Cho, <b>Suhan Woo</b> , Hongje Seong, Euntai Kim <a href="#">Page</a>	Jun 2025

## Projects

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### **Development of Cooperative Mapping, Environment Recognition and Autonomous Driving Technology for Multi Mobile Robots Operating in Large-scale Indoor Workspace**

Apr 1, 2023 - Present

- Funded by Korea Evaluation Institute Of Industrial Technology
- Development of BEV semantic segmentation technology for efficient operation of multirobots.

### **Development of 3D indoor map service**

May 1, 2022 - Sep 30, 2022

- Funded by LG Electronics, Korea
- Development of 3D indoor mapping technology using semantic information.

### **Development of artificial intelligence robot autonomous navigation technology for agile movement in crowded space**

Apr 1, 2019 - Dec 31, 2022

- Funded by Ministry of Trade, Industry and Energy, Korea
- Development of real-time traversability estimation technology based on semantic segmentation in various environments (season, day and night)

### **Scene parsing and static local map generation using RGBD image in outdoor environment**

Mar 18, 2019 - Oct 31, 2019

- Funded by LG Electronics, Korea
- Development of real-time semantic segmentation algorithm using RGB and RGBD sensors

### **Development of robust detection and tracking system for accident prevention in autonomous vehicle**

Mar 1, 2019 - Feb 28, 2022

- Funded by National Research Foundation of Korea
- Corner case data augmentation algorithm research for robust object detection

### **Development of real-time object recognition technology based on deep learning for autonomous vehicles**

Aug 1, 2017 - Dec 31, 2020

- Funded by National Research Foundation of Korea
- Deep learning algorithm research using video data

### **Development of real-time object recognition technology based on deep learning for autonomous vehicles**

Aug 1, 2017 - Sept 30, 2018

- Funded by Hyundai MNSoft, Korea
- Development of real-time traffic signs, traffic lights, and lane detection algorithms in driving vehicles

## Patents

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### **Method and Apparatus for Place Recognition Using Hierarchical Feature Representation in Hyperbolic Space**

Euntai Kim, and **Suhan Woo**

Korea - Application No. 10-2025-0066776

### **Apparatus for Recognizing a Place based on Artificial Neural Network and Learning Method thereof**

Euntai Kim, Hongje Seong, Junhyuk Hyun, Suhyeon Lee, **Suhan Woo**, and Hyunbae Chang

Korea - Application No. 10-2019-0041544

Korea - Registration No. 10-2211842

International (PCT) - Application No. PCT/KR2020/001018

### **Apparatus and Method for Detecting Object based on Heterogeneous Sensor**

Euntai Kim, Junhyuk Hyun, Suhyeon Lee, **Suhan Woo**, and Hongje Seong  
Korea - Application No. 10-2018-0055179  
Korea - Registration No. 10-2138681

### **Method and Apparatus for Generating Scene Situation Information of Video Using Differentiation of Image Feature and Supervised Learning**

Euntai Kim, Junhyuk Hyun, Suhyeon Lee, **Suhan Woo**, and Hongje Seong  
Korea - Application No. 10-2018-0049520  
Korea - Registration No. 10-2120453

## **Technologies**

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**Languages:** C, Python, Matlab