

# Hongje Seong

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## Research Interest

Computer vision, visual segmentation, matting, visual recognition, domain adaptation / generalization, image retrieval, place recognition

## Education

### Yonsei University

PH.D CANDIDATE SCHOOL OF ELECTRICAL AND ELECTRONIC ENGINEERING

• **Advisor:** Prof. Euntai Kim

Seoul, Korea

Mar 2018 - Feb 2023

### Yonsei University

B.S. SCHOOL OF ELECTRICAL AND ELECTRONIC ENGINEERING

Seoul, Korea

Mar 2012 - Feb 2018

## Experience

### Samsung Advanced Institute of Technology (SAIT)

RESEARCHER

Computer Vision Lab

Suwon, Korea

Mar 2023 - Current

### Adobe Research

RESEARCH INTERN

• **Mentors:** Joon-Young Lee, Seoung Wug Oh, and Brian Price

San Jose, CA, USA (remote)

Mar 2021 - Dec 2021

### Yonsei University

RESEARCH ASSISTANT @ CILAB

Participation in several research projects

Seoul, Korea

Mar 2018 - Current

### Yonsei University

TEACHING ASSISTANT

- Data Structure and Algorithms
- Introduction Artificial Intelligence

Seoul, Korea

Mar 2018 - Dec 2018

## Publications

### JOURNAL

#### 2023

##### Fallen Person Detection for Autonomous Driving

Suhyeon Lee, Sangyong Lee, Hongje Seong, Junhyuk Hyun, and Euntai Kim

Expert Systems With Applications (*ESWA*), vol. 213, pp. 119242, March, 2023. (IF: **8.665** in JCR2021)

##### Video Object Segmentation using Kernelized Memory Network with Multiple Kernels

Hongje Seong, Junhyuk Hyun, and Euntai Kim

IEEE Transactions on Pattern Analysis and Machine Intelligence (*TPAMI*), vol. 45, no 2, pp. 2595-2612, February, 2023. (IF: **24.314** in JCR2021)

#### 2022

##### Adjacent Feature Propagation Network (AFPNet) for Real-Time Semantic Segmentation

Junhyuk Hyun, Hongje Seong, Sangki Kim, and Euntai Kim

IEEE Transactions on Systems, Man, and Cybernetics: Systems (*TSMC*), vol. 52, no. 9, pp. 5877-5888, September, 2022. (IF: **11.471** in JCR2021)

## Indoor Place Category Recognition for a Cleaning Robot by Fusing a Probabilistic Approach and Deep Learning

Soowook Choe\*, Hongje Seong\*, and Euntai Kim (\*equal contribution)

IEEE Transactions on Cybernetics (**TCYB**), vol. 52, no. 8, pp. 7265-7276, August, 2022. (IF: **19.118** in JCR2021)

## Content Swapping: A New Image Synthesis for Construction Sign Detection in Autonomous Vehicles

Hongje Seong, Seunghyun Baik, Youngjo Lee, Suhyeon Lee, and Euntai Kim

Sensors, vol. 22, no. 9, pp. 3494, May, 2022. (IF: **3.847** in JCR2021)

## 2021

### Universal Pooling - A New Pooling Method for Convolutional Neural Networks

Junhyuk Hyun, Hongje Seong, and Euntai Kim

Expert Systems With Applications (**ESWA**), vol. 180, pp. 115084, October, 2021. (IF: **6.954** in JCR2020)

## 2020

### FOSNet: An End-to-End Trainable Deep Neural Network for Scene Recognition

Hongje Seong, Junhyuk Hyun, and Euntai Kim

IEEE Access, vol. 8, pp. 82066-82077, April, 2020. (IF: **3.745** in JCR2019)

## CONFERENCE

## 2023

### Revisiting Self-Similarity: Structural Embedding for Image Retrieval

Seongwon Lee, Suhyeon Lee, Hongje Seong, and Euntai Kim

IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), June, 2023.

### SHUNIT: Style Harmonization for Unpaired Image-to-Image Translation

Seokbeom Song, Suhyeon Lee, Hongje Seong, Kyoungwon Min, and Euntai Kim

AAAI Conference on Artificial Intelligence (**AAAI**), February, 2023.

### Domain Adaptive Video Semantic Segmentation via Cross-Domain Moving Object Mixing

Kyusik Cho, Suhyeon Lee, Hongje Seong, and Euntai Kim

IEEE/CVF Winter Conference on Applications of Computer Vision (**WACV**), January, 2023.

## 2022

### One-Trimap Video Matting

Hongje Seong, Seoung Wug Oh, Brian Price, Euntai Kim, and Joon-Young Lee

European Conference on Computer Vision (**ECCV**), October, 2022.

**Winner** at Qualcomm Innovation Fellowship 2022

### Spatial-Channel Transformer for Scene Recognition

Seunghyun Baik, Hongje Seong, Youngjo Lee, and Euntai Kim

International Joint Conference on Neural Networks (**IJCNN**), July, 2022.

### WildNet: Learning Domain Generalized Semantic Segmentation from the Wild

Suhyeon Lee, Hongje Seong, Seongwon Lee, and Euntai Kim

IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), June, 2022.

**Finalist** at Qualcomm Innovation Fellowship 2022

### Correlation Verification for Image Retrieval

Seongwon Lee, Hongje Seong, Suhyeon Lee, and Euntai Kim

IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), June, 2022. ([Oral presentation](#))

**Winner** at Qualcomm Innovation Fellowship 2022

### Iteratively Selecting an Easy Reference Frame Makes Unsupervised Video Object Segmentation Easier

Youngjo Lee, Hongje Seong, and Euntai Kim

AAAI Conference on Artificial Intelligence (**AAAI**), February, 2022.

### Graph-Based Point Tracker for 3D Object Tracking in Point Clouds

Minseong Park, Hongje Seong, Wonje Jang, and Euntai Kim

AAAI Conference on Artificial Intelligence (**AAAI**), February, 2022.

## 2021

### Hierarchical Memory Matching Network for Video Object Segmentation

Hongje Seong, Seoung Wug Oh, Joon-Young Lee, Seongwon Lee, Suhyeon Lee, and Euntai Kim  
IEEE/CVF International Conference on Computer Vision (ICCV), October, 2021.

### Improving Nighttime Object Detection by Generating Synthetic Nighttime Dataset from Daytime Dataset

Youngjo Lee, Suhyeon Lee, Hongje Seong, and Euntai Kim  
International Conference on Control, Automation and Systems (ICCAS), October, 2021. (Best poster paper award)

### Loop Closure Detection in Crowded Place

Seongwon Lee, HyungGi Jo, Hongje Seong, and Euntai Kim  
IEEE Region 10 Symposium (TENSymp), August, 2021.

### Metric Learning in Mini-batch for Robust 6-DoF Camera Relocalization in Outdoor Environments

Gyuhyeon Pak, Hongje Seong, and Euntai Kim  
International Conference on Ubiquitous Robots (UR), June, 2021.

### The Effective Method for 3D LiDAR Point Clouds Processing

Youngjoo Kim, Hongje Seong, Wonje Jang, and Euntai Kim  
International Conference on Ubiquitous Robots (UR), June, 2021.

### Unsupervised Domain Adaptation for Semantic Segmentation by Content Transfer

Suhyeon Lee, Junhyuk Hyun, Hongje Seong, and Euntai Kim  
AAAI Conference on Artificial Intelligence (AAAI), February, 2021.

## 2020

### Kernelized Memory Network for Video Object Segmentation

Hongje Seong, Junhyuk Hyun, and Euntai Kim  
European Conference on Computer Vision (ECCV), August, 2020.  
IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW-DAVIS), June, 2020. (3rd place award)

### Is Whole Object Information Helpful for Scene Recognition?

Hongje Seong, Junhyuk Hyun, and Euntai Kim  
International Conference on Ubiquitous Robots (UR), June, 2020.

## 2019

### Video Multitask Transformer Network

Hongje Seong, Junhyuk Hyun, and Euntai Kim  
IEEE/CVF International Conference on Computer Vision Workshops (ICCVW-CoView), October, 2019. (4th place award)  
Workshop on Frontiers of Electrical Engineering (FREE) in Yonsei University, October, 2019. (Best poster award 3rd place)

### Partial Convolution for Scene Recognition

Hongje Seong, Junhyuk Hyun, Seongwon Lee, and Euntai Kim  
International Conference on Control, Automation and Systems (ICCAS), October, 2019.

### Scene Recognition via Object-to-Scene Class Conversion: End-to-End Training

Hongje Seong, Junhyuk Hyun, Hyunbae Chang, Suhyeon Lee, Suhan Woo, and Euntai Kim  
International Joint Conference on Neural Networks (IJCNN), July, 2019.

## 2018

### New Feature-level Video Classification via Temporal Attention Model

Hongje Seong, Junhyuk Hyun, Suhyeon Lee, Suhan Woo, Hyunbae Chang, and Euntai Kim  
ACM International Conference on Multimedia Workshops (MMW-CoView), October, 2018. (2nd place award)

### Weakly Supervised Temporal Localization in Video Scene Recognition

Junhyuk Hyun, Hongje Seong, Suhyeon Lee, Suhan Woo, and Euntai Kim  
International Conference on Control, Automation and Systems (ICCAS), October, 2018.

## Awards & Honors

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2023	<b>Grand Award (1st Place) (₩2,000,000)</b> Outstanding Graduate Student	<i>BK21 Y-BASE, School of Electrical &amp; Electronic Engineering, Yonsei University</i>
2022	<b>Winner (₩4,000,000)</b> Qualcomm Innovation Fellowship (QIFK 2022)	<i>Qualcomm</i>
2022	<b>Outstanding Reviewer</b> European Conference on Computer Vision (ECCV 2022)	<i>ECCV'22</i>
2020	<b>3rd Place Award</b> The 2020 DAVIS Challenge on Video Object Segmentation (DAVIS 2020)	<i>DAVIS'20 (CVPR Workshop)</i>
2019	<b>Best Poster Award 3rd Place</b> Workshop on Frontiers of Electrical Engineering (FREE 2019)	<i>School of Electrical &amp; Electronic Engineering, Yonsei University</i>
2018	<b>2nd Place Award</b> The 1st Workshop and Challenge on Comprehensive Video Understanding in the Wild (CoView 2018)	<i>CoView'18 (ACM MM Workshop)</i>
2017	<b>4th Place Award</b> Autonomous Car Racing in 2017 International Student Car Competition	<i>Korea Transportation Safety Authority (TS) &amp; Korea Auto-Vehicle Safety Association (KASA)</i>
2015	<b>Scholarship (₩2,331,000)</b> Hope-sharing Foundation	<i>KT</i>

## Patents

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### Joint Trimap Estimation and Alpha Matte Prediction for Video Matting

Joon-Young Lee, Seoungwug Oh, Brian Price, and Hongje Seong

US patents in pending

### Apparatus and method for domain adaptation using zero style loss

Euntai Kim, Suhyeon Lee, Junhyuk Hyun, and Hongje Seong

Korea - Application No. 10-2021-0003078

Korea - Registration No. 10-2483738

### Apparatus and method for solving class imbalance problem of domain adaptation using content transfer

Euntai Kim, Suhyeon Lee, Hongje Seong, and Junhyuk Hyun

Korea - Application No. 10-2021-0003077

### Apparatus for predicting traffic line of box-level multiple object using only position information of box-level multiple object

Euntai Kim, Youngjo Lee, Hongje Seong, and Junhyuk Hyun

Korea - Application No. 10-2020-0149533

Korea - Registration No. 10-2454281

### Apparatus for predicting movement of box-level object using only position information of box-level object

Euntai Kim, Youngjo Lee, Hongje Seong, and Junhyuk Hyun

Korea - Application No. 10-2020-0149532

### Pixel Level Video Object Tracking Apparatus Using Box Level Object Position Information

Euntai Kim, Hongje Seong, Youngjo Lee, and Junhyuk Hyun

Korea - Application No. 10-2020-0030214

International (PCT) - Application No. PCT/KR2020/005383

### Action Recognition Method and Apparatus in Untrimmed Videos Based on Artificial Neural Network

Euntai Kim, Hongje Seong, and Junhyuk Hyun

Korea - Application No. 10-2020-0029743

Korea - Registration No. 10-2357000

### 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

## Projects

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(Apr 2021 - Feb 2023) Development of multipurpose mid-size bus platform technology for automated driving based on predefined route  
Ministry of Trade, Industry and Energy (MOTIE)

(Sep 2020 - Jun 2021) 클라우드기반 도로객체인식 개발 PoC  
LG U+ & Soonchunhyang University

(Sep 2017 - Dec 2020) Research on fundamental technology for deep learning-based semantic state understanding  
National Research Foundation of Korea (NRF)

(Sep 2017 - May 2019) Development of part-based pedestrian detection and tracking system for autonomous vehicle  
National Research Foundation of Korea (NRF)

## Activities

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### REVIEWER

AAAI 2023

CVPR 2022, 2023

ECCV 2022

UR 2022

IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)

Springer International Journal of Computer Vision (IJCV)

IEEE Transactions on Image Processing (TIP)

Elsevier Pattern Recognition (PR)

Elsevier Expert Systems With Applications (ESWA)

Elsevier Knowledge-Based Systems (KNOSYS)

Elsevier Applied Soft Computing (ASOC)

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