

Hyun Seok Seong

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I am a Ph.D. candidate at Sungkyunkwan University, South Korea. My research focuses on representation learning for image and video understanding under limited supervision, including multi-modal learning. More broadly, I have extensive experience addressing real-world challenges such as domain generalization, few-shot & open-set & long-tailed recognition.

Education

Sungkyunkwan University (SKKU), South Korea

Sep. 2019 - Present

- Integrated M.S. and Ph.D., Artificial Intelligence
- Advisor: Prof. Jae-Pil Heo

Sungkyunkwan University (SKKU), South Korea

Mar. 2013 - Feb. 2019

- B.S., Electronic and Electrical Engineering

Publications

- ▶ From Vicious to Virtuous Cycles: Synergistic Representation Learning for Video Object-Centric Learning
International Conference on Learning Representations (ICLR), 2026
Hyun Seok Seong*, WonJun Moon*, and Jae-Pil Heo (*: **equal contribution**)
- ▶ Selective Contrastive Learning for Weakly Supervised Affordance Grounding
IEEE/CVF International Conference on Computer Vision (ICCV), 2025
WonJun Moon*, **Hyun Seok Seong***, and Jae-Pil Heo (*: **equal contribution**)
- ▶ Temporal Alignment-Free Video Matching for Few-shot Action Recognition
IEEE/CVF Conference Computer Vision and Pattern Recognition (CVPR), 2025 [**Oral presentation**]
SuBeen Lee, WonJun Moon, **Hyun Seok Seong**, and Jae-Pil Heo
- ▶ Foreground-Covering Prototype Generation and Matching for SAM-Aided Few-Shot Segmentation
AAAI Conference on Artificial Intelligence (AAAI), 2025
Suho Park*, SuBeen Lee*, **Hyun Seok Seong**, Jaejoon Yoo, and Jae-Pil Heo (*: equal contribution)
- ▶ Progressive Proxy Anchor Propagation for Unsupervised Semantic Segmentation
European Conference on Computer Vision (ECCV), 2024
Hyun Seok Seong, WonJun Moon, SuBeen Lee, and Jae-Pil Heo
- ▶ Task-Oriented Channel Attention for Fine-Grained Few-Shot Classification
IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2024
SuBeen Lee, WonJun Moon, **Hyun Seok Seong**, and Jae-Pil Heo
- ▶ Task-disruptive Background Suppression for Few-Shot Segmentation
AAAI Conference on Artificial Intelligence (AAAI), 2024
Suho Park, SuBeen Lee, Sangeek Hyun, **Hyun Seok Seong**, and Jae-Pil Heo
- ▶ Leveraging Hidden Positives for Unsupervised Semantic Segmentation
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2023
Hyun Seok Seong, WonJun Moon, SuBeen Lee, and Jae-Pil Heo
- ▶ Minority-Oriented Vicinity Expansion with Attentive Aggregation for Video Long-Tailed Recognition
AAAI Conference on Artificial Intelligence (AAAI), 2023 [**Oral presentation**]
WonJun Moon, **Hyun Seok Seong**, and Jae-Pil Heo
- ▶ TCX: Texture and Channel Swappings for Domain Generalization
Pattern Recognition Letters, 2023
Jaehyun Choi, **Hyun Seok Seong**, Sanguk Park, and Jae-Pil Heo
- ▶ Difficulty-Aware Simulator for Open Set Recognition
European Conference on Computer Vision (ECCV), 2022
WonJun Moon, Junho Park, **Hyun Seok Seong**, Cheol-Ho Cho, and Jae-Pil Heo

- Pivot-Guided Embedding for Domain Generalization
IEEE Access, 2022
Hyun Seok Seong, Jaehyun Choi, Woojin Jeong, and Jae-Pil Heo

[Under review]

- ▷ Cross-Layer Relational Representation Modeling for Few-Shot AI-Generated Image Detection
Hyun Seok Seong, Jaehyun Choi, ..., and Jae-Pil Heo
- ▷ Reconstruction-Guided Slot Curriculum: Addressing Object Over-Fragmentation in Video Object-Centric Learning
WonJun Moon, Hyun Seok Seong, and Jae-Pil Heo
- ▷ Looking Beyond the Window: Global-Local Aligned CLIP for Training-free Open-Vocabulary Semantic Segmentation
ByeongCheol Lee, Hyun Seok Seong, Sangeek Hyun, Gilhan Park, WonJun Moon, Jae-Pil Heo
- ▷ Auxiliary Descriptive Knowledge for Few-Shot Adaptation of Vision-Language Model
SuBeen Lee, Gilhan Park, WonJun Moon, Hyun Seok Seong, and Jae-Pil Heo
- ▷ Negative Visual Reference Prompt for SAM-Aided Few-Shot Segmentation
SuBeen Lee*, Suho Park*, Hyun Seok Seong, Jaejoon Yoo, and Jae-Pil Heo (*: equal contribution)

Projects

Comprehensive Deepfake Detection Incorporating Common Sense Error Analysis - Role: Project member (AI-generated image detection)	Sep. 2025 - Present
Named Entity Recognition for Video Understanding AI - Role: Project member (MLLM-based NER model development and evaluation)	Apr. 2025 - Sep. 2025
Detection of AI-based Fake Investigation and Tip Videos - Role: Project co-leader (Video forgery detection, Video inpainting, Video-to-video translation) - Awarded by the Minister of the Ministry of Science and ICT: Outstanding Achievement in Social Problem-Solving R&D	Jul. 2021 - Feb. 2025
Reconstruction of Non-Line-of-Sight Scene for VR/AR Contents - Role: Project member (Long-tailed recognition and image reconstruction)	Jan. 2020 - Dec. 2020
Developing Vision-based Crowd-enabled Intelligent Surveillance System - Role: Project leader (2021), Project member (2019 - 2020) (Object detection&tracking, person re-identification)	Feb. 2019 - Apr. 2021
Designing Optimal Domain Adaptation Model for Cost-saving in Data - Role: Project member (Domain adaptation & generalization)	Feb. 2019 - Nov. 2019

External Activities

Seoul Forum on AI Safety & Security — Red Teaming Competition - Organization: ETRI AI Safety Institute & Scale AI - Focus: LLM jailbreak / AI vulnerability assessment - Role: Red teaming competition participant (2nd place award)	Oct. 2025
Korea Innovation Challenge Research Expo (2024 APRO Open Lab) - Organization: Ministry of Science and ICT - Role: Exhibitor - Related project: Detection of AI-based Fake Investigation and Tip Videos	Dec. 2024
Korea Police World Expo - Organization: Korean national police agency & Incheon Metropolitan City, South Korea - Role: Exhibitor - Keywords: Crowd-enabled intelligent surveillance system & Video forgery detection model	2019 2020 2022 2023 2024