Hyun Seok Seong

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I am a Ph.D. candidate at Sungkyunkwan University, South Korea. My research primarily focuses on representation learning (self-supervised learning) for image segmentation and grounding under limited supervision. I am also interested in foundation models, including multi-modal learning and video understanding. More broadly, I have extensive experience addressing real-world challenges such as domain generalization, few-shot and open-set recognition, and 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

- Selective Contrastive Learning for Weakly Supervised Affordance Grounding (Link)
  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 (Link)
  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 (Link)
  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 (Link)
  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 (Link)
  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 (Link)
  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 (Link)
  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 (Link)
  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 (Link)
  Pattern Recognition Letters, 2023
  Jaehyun Choi, **Hyun Seok Seong**, Sanguk Park, and Jae-Pil Heo
- Difficulty-Aware Simulator for Open Set Recognition (Link)
  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 (Link)
  IEEE Access, 2022
  Hyun Seok Seong, Jaehyun Choi, Woojin Jeong, and Jae-Pil Heo

Projects

Comprehensive Deepfake Detection Incorporating Common Sense Error Analysis **Sep. 2025 - Present**
- Supported by Ministry of Science and ICT ($1.4M a year)
- Role: Project member (Research on AI-generated image detection)
- Keywords: AI-generated image detection / Deepfake detection

Named Entity Recognition for Video Understanding AI **Apr. 2025 - Sep. 2025**
- Supported by PYLER (url)
- Role: Project member (NER model development and evaluation)
- Keywords: Video Understanding / Named-Entity Recognition / Large (Vision)-Language Model

Detection of AI-based Fake Investigation and Tip Videos (Video) **Jul. 2021 - Feb. 2025**
- Supported by Korean national police agency & Ministry of Science and ICT ($2.2M in total)
- Role: Project co-leader
- Keywords: Deepfake detection / 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

Reconstruction of Non-Line-of-Sight Scene for VR/AR Contents (Video / Slide) **Jan. 2020 - Dec. 2020**
- Supported by Ministry of Science and ICT ($2.1M in total)
- Role: Project member
- Keywords: Long-tailed classification / Image reconstruction

Developing Vision-based Crowd-enabled Intelligent Surveillance System (Video / Demo) **Feb. 2019 - Apr. 2021**
- Supported by Korean national police agency & Ministry of Science and ICT ($1.0M in total)
- Role: Project leader (2021), Project member (2019 - 2020)
- Keywords: Object detection / Object tracking / Super-resolution / Person re-identification

Designing Optimal Domain Adaptation Model for Cost-saving in Data **Feb. 2019 - Nov. 2019**
- Supported by Electronics and Telecommunications Research Institute
- Role: Project member
- Keywords: Domain adaptation / Domain generalization

External Activities

Seoul Forum on AI Safety & Security — Red Teaming Competition **Oct. 2025**
- Organization: ETRI AI Safety Institute & Scale AI
- Keywords: LLM jailbreak / AI vulnerability assessment
- Role: Red teaming competition participant **(2nd place award)**

Korea Innovation Challenge Research Expo (2024 APRO Open Lab) **Dec. 2024**
- Organization: Ministry of Science and ICT
- Role: Exhibitor
- Related project: Detection of AI-based Fake Investigation and Tip Videos

Korean Conference on Computer Vision (KCCV) 2023 **Aug. 2023**
- Organization: Korean Computer Vision Society (KCVS)
- Role: Poster presenter
- Presentation paper: Leveraging Hidden Positives for Unsupervised Semantic Segmentation, CVPR 2023

Korea Police World Expo **2019 | 2020 | 2022 | 2023 | 2024**
- Organization: Korean national police agency & Incheon Metropolitan City, South Korea
- Role: Exhibitor
- Keywords: Crowd-enabled intelligent surveillance system & Video forgery detection model