Minhyeok Lee

Computer Vision Engineer, ML/DL Researcher
E-mail: hydragon516@yonsei.ac.kr / Github: https://github.com/Hydragon516
/ Homepage: https://hydragon.co.kr

RESEARCH INTERESTS

Scene Understanding

- Salient Object Detection
- Video Object Segmentation
- Camouflaged Object Detection
- Video Anomaly Detection
- Skeleton based Action Recognition

Multimodal Vision

- Referring Image Segmentation

Generative Model

- Video Diffusion Inpainting

Autonomous Driving

- Lane Detection
- Monocular Depth Estimation
- LiDAR Point Cloud

3D Novel View Synthesis

- Neural Radiance Field

EDUCATION

Yonsei University | College of Engineering — ***Seoul, Korea***
Integrated M.S./Ph.D. in Electrical and Electronic Engineering — ***Mar. 2021-Present***
Image and Video Pattern Recognition Lab. (M.S/Ph.D 7th)

Yonsei University | College of Engineering — ***Seoul, Korea***
B.S. in Electrical and Electronic Engineering — ***Mar.2017-Feb.2021***

Hansung Science High School — ***Seoul, Korea***
Mar.2014-Feb.2017

PUBLICATIONS

Guided Slot Attention for Unsupervised Video Object Segmentation, ***CVPR'24***
- **Minhyeok Lee**, Suhwan Cho, Dogyoon Lee, Chaewon Park, Jungho Lee, Sangyoun Lee

Dual Prototype Attention for Unsupervised Video Object Segmentation, ***CVPR'24***
-Suhwan Cho*, **Minhyeok Lee***, Seunghoon Lee, Sangyoun Lee

Video Diffusion Models are Strong Video Inpainter, *arXiv'24*
- **Minhyeok Lee**, Suhwan Cho, Chajin Shin, Jungho Lee, Sunghun Yang, Sangyoun Lee

SMURF: Continuous Dynamics for Motion-Deblurring Radiance Fields, *arXiv'24*
- Jungho Lee, Dogyoon Lee, **Minhyeok Lee**, Donghyung Kim, Sangyoun Lee

Boundary-aware Camouflaged Object Detection via Deformable Point Sampling, *ICEIC'24*
-**Minhyeok Lee**, Suhwan Cho, Chaewon Park, Dogyoon Lee, Jungho Lee, Sangyoun Lee

Synchronizing Vision and Language: Bidirectional Token-Masking AutoEncoder for Referring Image Segmentation, *arXiv'23*
- **Minhyeok Lee**, Dogyoon Lee, Jungho Lee, Suhwan Cho, Heeseung Choi, Ig-Jae Kim, Sangyoun Lee

Hierarchically decomposed graph convolutional networks for skeleton-based action recognition, ***ICCV'23***
- Jungho Lee, **Minhyeok Lee**, Dogyoon Lee, Sangyoun Lee

Leveraging spatio-temporal dependency for skeleton-based action recognition, ***ICCV'23***
- Jungho Lee, **Minhyeok Lee**, Suhwan Cho, Sungmin Woo, Sungjun Jang, Sangyoun Lee

DP-NeRF: Deblurred Neural Radiance Field with Physical Scene Priors, ***CVPR'23***
-Dogyoon Lee, **Minhyeok Lee**, Chajin Shin, Sasngyoun Lee

Unsupervised Video Object Segmentation via Prototype Memory Network. *WACV'23*
- **Minhyeok Lee**, Suhwan Cho, Seunghoon Lee, Chaewon Park, Sangyoun Lee

Treating Motion as Option to Reduce Motion Dependency in Unsupervised Video Object Segmentation *WACV'23*
- Suhwan Cho, **Minhyeok Lee**, Seunghoon Lee, Chaewon Park, Donghyeong Kim, Sangyoun Lee

Adaptive Graph Convolution Module for Salient Object Detection *ICIP'23*
- Yongwoo Lee, **Minhyeok Lee**, Suhwan Cho, Sangyoun Lee

TSANET: Temporal and Scale Alignment for Unsupervised Video Object Segmentation *ICIP'23*
- Seunghoon Lee, Suhwan Cho, Dogyoon Lee, **Minhyeok Lee**, Sangyoun Lee

Two-stream Decoder Feature Normality Estimating Network for Industrial Anomaly Detection *ICASSP'23*
- Chaewon Park, **Minhyeok Lee**, Suhwan Cho, Donghyeong Kim, Sangyoun Lee

Pixel-Level Equalized Matching for Video Object Segmentation, *arXiv'22*
- Suhwan Cho, Woo Jin Kim, MyeongAh Cho, Seunghoon Lee, **Minhyeok Lee**, Chaewon Park, Sangyoun Lee

RandomSEMO: Normality Learning of Moving Objects For Video Anomaly Detection, *arXiv'22*
- Chaewon Park, **Minhyeok Lee**, MyeongAh Cho, Sangyoun Lee

SPSN: Superpixel Prototype Sampling Network for RGB-D Salient Object Detection, ***ECCV'22***
- **Minhyeok Lee***, Chaewon Park*, Suhwan Cho, Sangyoun Lee

Tackling Background Distraction in Video Object Segmentation, ***ECCV'22***
- Suhwan Cho, Heansung Lee, **Minhyeok Lee**, Chaewon Park, Sungjun Jang, Minjung Kim, Sangyoun Lee

Saliency Detection via Global Context Enhanced Feature Fusion and Edge Weighted Loss, *ICIP'22*
- Chaewon Park*, **Minhyeok Lee***, MyeongAh Cho, Sangyoun Lee

Robust Lane Detection via Expanded Self Attention, *WACV'22*
- **Minhyeok Lee**, Junhyeop Lee, Dogyoon Lee, Woojin Kim, Sangwon Hwang, Sangyoun Lee

EdgeConv with Attention Module for Monocular Depth Estimation, *WACV'22*
- **Minhyeok Lee**, Sangwon Hwang, Chaewon Park, Sangyoun Lee

FastAno: Fast Anomaly Detection via Spatio-temporal Patch Transformation, *WACV'22*
- Chaewon Park, MyeongAh Cho, **Minhyeok Lee**, Sangyoun Lee

Multi-level Feature maps Attention for Monocular Depth Estimation, *ICCE-Asia'21*
- Seunghoon Lee, **Minhyeok Lee**, Sangyoun Lee

Regularization Strategy for Point Cloud via Rigidly Mixed Sample, ***CVPR'21***
- Dogyoon Lee, Jaeha Lee, Junhyeop Lee, Hyeongmin Lee, **Minhyeok Lee**, Sungmin Woo, Sangyoun Lee

PROJECTS

Development of degradation removal and video enhancement using artificial intelligence ***Yonsei University***
- Funded by Tech Incubator Program for startup Korea (TIPS) ***Nov.2022-Present***
- Deep learning researcher
- Video Enhancement, Video Super Resolution
- Development of an efficient intelligent image processing algorithm that is robust on complex degradation

Development of learning technology to improve classification performance based on LiDAR point cloud ***Yonsei University***
- Funded by Hyundai Motor Company ***Apr.2021-Mar.2022***
- Deep learning researcher
- Development of unsupervised and semi-supervised learning algorithms
- Development of lightweight models for point cloud classification

Road conditions and autonomous bus AI data ***Yonsei University***
- Funded by National Information society Agency (NIA) ***Sep.2020-Jun.2021***
- Deep learning researcher
- Crack and Obstacle Segmentation
- Development of Road anomaly detection algorithms and models