

Wonseok Roh

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Research Interests

Computer Vision : 3D Object Detection, 3D Instance Segmentation, 3D Pose Estimation, 3D Reconstruction, Hand Action Recognition, Autonomous Driving, Virtual Try-On

Machine Learning : Domain Generalization and Adaptation, Multi-modal Learning, Self-Supervised Learning

Education

Korea University

Seoul, South Korea

Ph.D. Student in Artificial Intelligence (Advisor: Prof. Sangpil Kim)

Mar. 2022 – Feb. 2027 (Expected)

University of Seoul

Seoul, South Korea

B.S. in Computer Science

Mar. 2016 – Feb. 2022

Experience

Computer Vision Lab @ Korea University

Ph.D. Student Researcher (Advisor: Prof. Sangpil Kim)

Mar. 2022 – Present

- 3D Scene Reconstruction (*collaborated with Dr. Innfarn Yoo & Andreas Lugmayr @ [Google Research](#)*) - [C7]
- 3D Instance Segmentation (*collaborated with Dr. Giljoo Nam @ [Meta Reality Labs](#)*) - [C6] and [C5]
- Hand Pose Estimation and Action Recognition (*collaborated with Dr. Hyung-gun Chi @ [Purdue Univ.](#)*) - [C3]
- 3D Object Detection for Autonomous Driving - [C2] and [P1]

Computer Vision Lab @ Samsung Advanced Institute of Technology (SAIT)

Visiting Student Researcher (Advisor: Dr. Sujin Jang)

Sep. 2022 – Mar. 2023

- Unsupervised Domain Adaptation approach based on Cross-modal Representation Learning with Multi-view RGB images and LIDAR point clouds for Autonomous Driving - [C4] and [P2]

Computer Vision Lab @ Korea University

Undergraduate Research Intern (Advisor: Prof. Sangpil Kim)

Sep. 2021 – Mar. 2022

- Multi-modal Representation Learning (*collaborated with Dr. Wonmin Byeon @ [NVIDIA Research](#)*) - [C1]

Research & Development Team @ DANO

Software Engineer (Full Stack)

Oct. 2018 – Aug. 2021

- Large-scale Traffic Handling and Database Optimizations for Dynamic Applications.
- Deep Learning Support System Management powered by Big Data Analytics.

Conference Publications

[C7] **Wonseok Roh**, Hwanhee Jung, Jong Wook Kim, Seunggwon Lee, Innfarn Yoo, Andreas Lugmayr, Seunggeun Chi, Karthik Ramani, Sangpil Kim, *[CATSplat: Context-Aware Transformer with Spatial Guidance for Generalizable 3D Gaussian Splatting from A Single-View Image](#)*, under review, 2025

[C6] **Wonseok Roh**, Hwanhee Jung, Giljoo Nam, Dong In Lee, Hyeongcheol Park, Sang Ho Yoon, Jungseock Joo, Sangpil Kim, *[Insightful Instance Features for 3D Instance Segmentation](#)*, IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) 2025 [PDF]

[C5] **Wonseok Roh**, Hwanhee Jung, Giljoo Nam, Jinseop Yeom, Hyunje Park, Sang Ho Yoon, Sangpil Kim, *[Edge-Aware 3D Instance Segmentation Network with Intelligent Semantic Prior](#)*, IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) 2024 [PDF]

[C4] **Wonseok Roh***, Gyusam Chang*, Sujin Jang, Dongwook Lee, Daehyun Ji, Gyeongrok Oh, Jinsun Park, Jinkyu Kim[†], Sangpil Kim[†], *[CMDA: Cross-Modal and Domain Adversarial Adaptation for LiDAR-Based 3D Object Detection](#)*, The 38th AAAI Conference on Artificial Intelligence (AAAI) 2024 [PDF]

[C3] **Wonseok Roh**, Seung Hyun Lee, Won Jeong Ryoo, Jakyung Lee, Gyeongrok Oh, Sooyeon Hwang, Hyung-gun Chi, Sangpil Kim, *Functional Hand Type Prior for 3D Hand Pose Estimation and Action Recognition from Egocentric View Monocular Videos*, British Machine Vision Conference (BMVC) 2023 **Oral presentation** (AR $\leq 5\%$) [PDF]

[C2] **Wonseok Roh**, Gyusam Chang, Seokha Moon, Giljoo Nam, Chanyoung Kim, Younghyun Kim, Sangpil Kim[†], Jinkyu Kim[†], *ORA3D: Overlap Region Aware Multi-view 3D Object Detection*, British Machine Vision Conference (BMVC) 2022 [PDF]

[C1] Seung Hyun Lee, **Wonseok Roh**, Wonmin Byeon, Sang Ho Yoon, Chanyoung Kim, Jinkyu Kim[†], Sangpil Kim[†], *Sound-guided Semantic Image Manipulation*, IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) 2022 [PDF]

Journal Publications

[J2] MinHyuk Jang, Jong Wook Kim, Youngdong Jang, Donghyun Kim, **Wonseok Roh**, InYong Hwang, Guang Lin, Sangpil Kim, *High-quality three-dimensional cartoon avatar reconstruction with Gaussian splatting*, Engineering Applications of Artificial Intelligence 2025: 110305 (JCR IF Top 10%) [PDF]

[J1] Sungjune Kim, Seongjun Yun, Jongwuk Lee, Gyusam Chang, **Wonseok Roh**, Dae-Neung Sohn, Jung-Tae Lee, Hogun Park[†], Sangpil Kim[†], *Self-supervised Multimodal Graph Convolutional Network for Collaborative Filtering*, Information Sciences 2023: 119760 (JCR IF Top 10%) [PDF]

Patents

[P2] Sujin Jang, Sangpil Kim, Jinkyu Kim, **Wonseok Roh**, Gyusam Chang, Dongwook Lee, Daehyun Ji, *Method and apparatus with object detector training*, U.S. Patent App. 18/451,287.

[P1] Younghyun Kim, Seowon Lee, Jinkyu Kim, Sangpil Kim, **Wonseok Roh**, *Apparatus and method for detecting an object and a computer readable recording medium therefor*, U.S. Patent App. 18/217,904.

Academic Service

Conference Reviewer

- IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) 2024, 2025
- IEEE/CVF International Conference on Computer Vision (ICCV) 2025
- IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) 2023
- Conference on Neural Information Processing Systems (Neurips) 2024
- International Conference on Learning Representations (ICLR) 2025

Educational Activities

Google Developers, Machine Learning Bootcamp

Aug. 2020 – Feb. 2021

TensorFlow, TensorFlow Developer Certificate

Jan. 2021

Skills

Programming

- Fluent in Python, Deep Learning Frameworks (PyTorch, PyTorch Lightning, TensorFlow), Python Libraries (MMCV, Hugging Face, Scikit-Learn, etc) Shell Script, Git, Django, Docker, L^AT_EX

Languages

- Native speaker in Korean
- Fluent in English