# Wonseok Roh

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## Research Interests

**Research Areas (Computer Vision):** 3D Perception, 3D Reconstruction, 3D Scene Understanding, Robotic Vision, Autonomous Driving, Object Detection, Instance Segmentation, Pose Estimation

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

## 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*

## Research Experience

**Amazon Robotics @ Amazon** — Berlin, Germany
*Applied Scientist Intern (Advisor: Dr. Erhan Gundogdu & Dr. Juxi Leitner)* — *Oct. 2025 – Apr. 2026*

- RGB-D-based 3D Shape Completion for Robotic Manipulation in Cluttered Scenarios
- Novel-view Synthesis and Multi-view Fusion for Complete 3D Object Geometry Reconstruction

**Computer Vision Lab @ Korea University** — Seoul, South Korea
*Ph.D. Student Researcher (Advisor: Prof. Sangpil Kim)* — *Mar. 2022 – Present*

- 3D Scene Reconstruction *(collaborated with Dr. Innfarn Yoo & Andreas Lugmayr @* ***Google****)* - [**C7**]
- 3D Instance Segmentation *(collaborated with Dr. Giljoo Nam @* ***Meta****)* - [**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** — Suwon, South Korea
*Visiting Student Researcher (Advisor: Dr. Sujin Jang)* — *Sep. 2022 – Mar. 2023*

- Unsupervised Domain Adaptation for Autonomous Driving
- Cross-modal Representation Learning with Multi-view Images and LiDAR Point Clouds - [**C4**] and [**P2**]

**Computer Vision Lab @ Korea University** — Seoul, South Korea
*Undergraduate Research Intern (Advisor: Prof. Sangpil Kim)* — *Sep. 2021 – Mar. 2022*

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

## Conference Publications

[**C7**] **Wonseok Roh**, Hwanhee Jung, Jong Wook Kim, Seunggwan 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***, IEEE/CVF International Conference on Computer Vision (**ICCV**) 2025 [PDF]

[**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, 2026*
- *IEEE/CVF International Conference on Computer Vision (ICCV) 2025*
- *The European Conference on Computer Vision (ECCV) 2026*
- *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) 2023*
- *Conference on Neural Information Processing Systems (NeurIPS) 2024, 2025*
- *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, LaTeX

**Languages**

- Native speaker in Korean
- Fluent in English