

# Inyoung Oh

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## Education

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**Ph.D. in Mechanical and Robotics Engineering / GIST** **Feb 2026**

- Ph.D. Dissertation - “Normal Vector Estimation and Semantic Segmentation of 3D Point Clouds using Deep Learning and Geometric Analysis” (Grade: 4.2/4.5)

**M.S. in Mechatronics / GIST** **Feb 2018**

- M.S. Thesis - “Sphere and Cylinder Detection in Kinect Point Clouds using RANSAC and the 2D Hough Transform” (Grade: 3.9/4.5)

**B.S. in Mechatronics / CNU** (Grade: 3.9/4.5) **Feb 2016**

Chungnam National University, Daejeon, Republic of Korea

## Research Experience (Advisor: Prof. Kwang Hee Ko)

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### Geometry-Aware 3D Perception and Representation Learning

- Architected SFD-Net for sharp feature detection by integrating multi-scale geometric descriptors with transformer attention, achieving SOTA F1-score on ABC and transferring to Kinect v2/S3DIS.
- Formulated a multi-scale attention-based normal estimation framework with noise-aware supervision and geometric regularization, achieving SOTA on the PCPNet primitive subset.
- Proposed a parameter-free, curvature-driven cylinder recognition method for unorganized point clouds.

### LiDAR Perception for Autonomous Driving

- Designed the intensity-assisted, normal-aware segmentation module that drove a +4% mIoU gain on SemanticKITTI and improved safety-critical classes (Bicycles +21%, Pedestrians +4%, Motorcyclists +15.2%).

### 2D Image-Based 6-DoF Pose Estimation and Mixed Reality Systems

- Engineered RoI-PCA color-space augmentation for robust 6-DoF pose estimation from 2D images and deployed it in a real-time MR remote collaboration system.

## Publications

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SFD-Net: Sharp Feature Detection Network Based on Local Geometric Features

**Inyoung Oh**; Kwang Hee Ko.

In preparation; planned submission: **Feb 2026**.

A Mixed Reality-based Remote Collaboration Framework Using Improved Pose Estimation

**Inyoung Oh**; Gilsang Jang; Jinho Song; Moongu Son; Daewoon Kim; Junsang Yun; Kwang Hee Ko.

*Computers in Industry*, vol. 174, 104414, **2026**.

Enhanced Point Cloud Normal Estimation via Multi-Scale Geometric Feature Fusion and Attention Mechanism

**Inyoung Oh**; Minsung Kim; Dongho Yun; Kwang Hee Ko.

Submitted **Nov 2025**; major revision (conditional acceptance) received **Jan 2026**.

Improved semantic segmentation network using normal vector guidance for LiDAR point clouds

Minsung Kim; **Inyoung Oh**; Dongho Yun; Kwang Hee Ko.

*Journal of Computational Design and Engineering*, vol. 10, issue 6, 2332–2344, **2023**.

Automated recognition of 3D pipelines from point clouds **Inyoung Oh**; Kwang Hee Ko.

*The Visual Computer*, vol. 37, issue 6, 1385–1400, **2021**.

## Patents

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Automated System for Detecting 3D Pipeline  
Kwang Hee Ko; **Inyoung Oh**.  
KR 2010-2135828 B1 (Registered), **July 8, 2020**.

## Mentorship and Teaching Experiences

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**Mentorship, Modeling and Simulation Lab** **2018–Present**

Mentored interns through end-to-end experimental workflows and data collection, leading to successful completion of a bachelor's thesis.

**Teaching Assistant, Engineering Analysis** **2020**

Led weekly recitations/office hours and designed assessment materials while delivering biweekly Python instruction to strengthen quantitative problem-solving.

**Teaching Assistant, Engineering Analysis** **2017**

Delivered weekly instruction and assessment support, including biweekly MATLAB/C++ tutorials focused on computational fundamentals.

## Presentations

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Automatic detection of cylindrical objects from unorganized point cloud **2018**

**Inyoung Oh**; Kwang Hee Ko.  
*EuroVR* (poster), London, UK.

A RANSAC-based Method for Detection of Multiple Spheres from a Point Cloud **2017**

**Inyoung Oh**; Kwang Hee Ko.  
*Computer Graphics International* (poster), Yokohama, Japan.

## Awards and Scholarships

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Outstanding PhD Student RA Scholarship, GIST **2025**

Best Poster Award, Korean CDE Society **2025**

Best Poster Award, Korean CDE Society **2024**

Best Poster Award, Korean CDE Society **2023**

CDE DX Encouragement Award, Korean CDE Society **2022**

Best Poster Award, Korean CDE Society **2021**

Best Poster Award, Korean CDE Society **2020**

Outstanding PhD Student RA Scholarship, GIST **2023**

Outstanding PhD Student RA Scholarship, GIST **2021**

Outstanding PhD Student RA Scholarship, GIST **2020**

Outstanding PhD Student RA Scholarship, GIST **2019**

Outstanding PhD Student RA Scholarship, GIST **2018**

GIST Scholarship (Government support – Doctoral studies) **2018–Present**

GIST Scholarship (Government support – Master's studies) **2016–2018**

## References

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**Prof. Kwang Hee Ko**, Professor, Gwangju Institute of Science and Technology

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**Prof. Jinho Song**, Professor, Hannam University

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