

# Minkyun Seo

✉ minkyunseo00@gmail.com 🌐 minkyunseo.github.io/ 💬 minkyun-seo/

## EDUCATION

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<b>Seoul National University (SNU)</b> Integrated Ph.D. Program in Computer Science and Engineering	Sep. 2025 – Present Seoul, Republic of Korea
• Advised by Prof. Jaesik Park at the Visual & Geometric Intelligence Lab (GPA: 4.07/4.3)	
<b>Seoul National University (SNU)</b> B.S. in Architectural Engineering, Computer Science and Engineering	Mar. 2019 – Aug. 2025 Seoul, Republic of Korea
• <b>Summa Cum Laude</b> , GPA: 3.93/4.3 (cumulative), 4.01/4.3 (CSE major)	
• <b>Best BS Thesis Award</b> : Towards Zero-Shot Point Cloud Registration across Diverse Environments	
• Jul. 2021 – Jan. 2023: Absence for mandatory military service	
<b>Sejong Science High School</b> Specialized High School for Gifted Students in Science and Mathematics	Mar. 2016 – Feb. 2019 Seoul, Republic of Korea

## RESEARCH INTEREST

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- Geometric Feature Learning, 3D Reconstruction, 3D Vision for Robotics Applications

## PUBLICATIONS

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1. Hyungtae Lim\*, Minkyun Seo\*, Luca Carlone, Jaesik Park†, “Towards Zero-Shot Point Cloud Registration Across Diverse Scales, Scenes, and Sensor Setups”, *arXiv preprint*, 2026
2. Minkyun Seo\*, Hyungtae Lim\*, Kanghee Lee, Luca Carlone, Jaesik Park†, “BUFFER-X: Towards Zero-Shot Point Cloud Registration in Diverse Scenes”, *Int. Conf. on Computer Vision (ICCV)*, 2025 (**Highlight**) [code]

## RESEARCH EXPERIENCE

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<b>Visual &amp; Geometric Intelligence Lab (PI: Jaesik Park)   SNU</b> Graduate Student Researcher	Sep. 2025 – Present Seoul, Republic of Korea
• Extended BUFFER-X to object-scale registration and heterogeneous sensor configurations (e.g., Ouster OS0-128 to Velodyne VLP-16)	
• Proposed BUFFER-X-Lite, an efficient variant with early-exit strategies and fast pose solvers, reducing computation time by 43% while preserving registration accuracy	
• Investigating cross-session map matching for multi-session localization and navigation using learned geometric descriptors	
<b>Visual &amp; Geometric Intelligence Lab (PI: Jaesik Park)   SNU</b> Research Intern	Dec. 2023 – Aug. 2025 Seoul, Republic of Korea
• Curated 11 benchmark datasets spanning indoor/outdoor environments, 6 geographic sites, 12 sensor types, and scales from 3.5m to 240m	
• Developed a zero-shot point cloud registration pipeline with adaptive voxel sizing and search radii, enabling robust cross-domain generalization without retraining	
<b>AIoT Lab (PI: Hyung-Sin Kim)   SNU</b> Research Intern	Jun. 2023 – Sep. 2023 Seoul, Republic of Korea
• Built ES-Studio, a controlled real-world studio for data collection with adjustable environmental lighting and camera sensor parameters	
• Conducted preliminary experiments on covariate shifts across environmental and sensor domains	

## PROJECTS

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<b>[P1] Inference Optimization for LFM2-8B-A1B</b>	Oct. 2025 – Dec. 2025
<ul style="list-style-type: none"><li>Implemented large-batch inference using pipeline parallelism, micro-batching, and MPI-based multi-GPU model parallelism, overlapping communication and computation</li><li>Optimized GPU execution by developing custom CUDA kernels with tiling and fusion, and designing slot-based memory management with asynchronous streams and buffer reuse to eliminate dynamic allocations</li></ul>	
<b>[P2] FastMRI Challenge, SNU</b>	Jun. 2024 – Sep. 2024
<ul style="list-style-type: none"><li>Scaled up VarNet-based MRI reconstruction models under limited GPU memory using mixed-precision training, gradient accumulation, and gradient checkpointing</li></ul>	
<b>[P3] Drone-Based 3D Reconstruction of SNU Lecture Hall</b>	Apr. 2024 – Jun. 2024
<ul style="list-style-type: none"><li>Reconstructed a 3D mesh model of the Lecture Hall at SNU from images captured using a drone</li><li>Analyzed conditions leading to poor 3D reconstruction outcomes, emphasizing the need for methods that address the limitations of real-world data collection</li></ul>	
<b>[P4] Department Office Chatbot</b>	May. 2024
<ul style="list-style-type: none"><li>Developed an administrative support chatbot using RAG with the Meta-Llama-3-8B-Instruct model</li><li>Integrated a diffusion model to provide contextualized responses with enhanced user experience</li></ul>	
<b>[P5] Avatar Texture Enhancement via 3D Patch-wise Loss</b>	Sep. 2023 – Dec. 2023
<ul style="list-style-type: none"><li>Improved avatar texture reconstruction by introducing a 3D patch-wise SSIM loss that captures local structural consistency and mitigates dominant color oversaturation caused by L1 loss</li></ul>	

## AWARDS AND SCHOLARSHIPS

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<b>ICCV 2025 Highlight Paper</b>	Oct. 2025
<b>Graduate Research Fellowship   DB Group</b>	Sep. 2025 – Present
<b>National Excellence Scholarship   Korea Student Aid Foundation</b>	Mar. 2021 – Jun. 2024
<ul style="list-style-type: none"><li>Full tuition awarded to the top-performing students in science and engineering across the nation</li></ul>	
<b>Merit-based Scholarship   SNU</b>	Sep. 2019 – Feb. 2021, Jul. 2024 – Dec. 2024

## SKILLS

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**Language:** Korean (Native), English (Fluent)

**Programming Languages:** Python, C/C++, Java, Javascript, RISC-V

**Frameworks/Misc:** Pytorch, Pytorch3D, Open3D, CUDA, Diffusers, LangChain, Git, Verilog

**3D Tools:** Rhinoceros 3D, AutoCAD, Solidworks, Meshlab, MeshRoom, Blender