

Minkyun Seo

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EDUCATION

Seoul National University (SNU) 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)	
Seoul National University (SNU) B.S. in Architectural Engineering, Computer Science and Engineering	Mar. 2019 – Aug. 2025 Seoul, Republic of Korea
• Summa Cum Laude , GPA: 3.93/4.3 (cumulative), 4.01/4.3 (CSE major)	
• Best BS Thesis Award : Towards Zero-Shot Point Cloud Registration across Diverse Environments	
• Jul. 2021 – Jan. 2023: Absence for mandatory military service	
Sejong Science High School Specialized High School for Gifted Students in Science and Mathematics	Mar. 2016 – Feb. 2019 Seoul, Republic of Korea

RESEARCH INTEREST

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

PUBLICATIONS

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

Visual & Geometric Intelligence Lab (PI: Jaesik Park) SNU Graduate Student Researcher	Sep. 2025 – Present Seoul, Republic of Korea
• Extended BUFFER-X to object-scale and heterogeneous sensor setups (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 multi-session localization and navigation using the proposed geometric descriptors for cross-session map matching	
Visual & Geometric Intelligence Lab (PI: Jaesik Park) SNU Research Intern	Dec. 2023 – Aug. 2025 Seoul, Republic of Korea
• Curated 11 datasets spanning diverse indoor and outdoor environments, geographic regions, 12 different sensors, and scales ranging from 3.5m to 240m	
• Developed a zero-shot point cloud registration pipeline that adaptively selects voxel size and search radii, enabling robust generalization across diverse scenes without retraining	
AIoT Lab (PI: Hyung-Sin Kim) SNU Research Intern	Jun. 2023 – Sep. 2023 Seoul, Republic of Korea
• Contributed to early-stage research on Covariate Shifts in Environment and Sensor Domain	
• Built ES-Studio, a controlled real-world studio for data collection with adjustable environmental lighting and camera sensor parameters	

PROJECTS

[P1] Inference Optimization for LFM2-8B-A1B	Oct. 2025 – Dec. 2025
<ul style="list-style-type: none">Implemented large-batch inference using pipeline parallelism, micro-batching, and MPI-based multi-GPU model parallelism, overlapping communication and computationOptimized 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	
[P2] FastMRI Challenge, SNU	Jun. 2024 – Sep. 2024
<ul style="list-style-type: none">Scaled up VarNet-based MRI reconstruction models under limited GPU memory using mixed-precision training, gradient accumulation, and gradient checkpointing	
[P3] Drone-Based 3D Reconstruction of SNU Lecture Hall	Apr. 2024 – Jun. 2024
<ul style="list-style-type: none">Reconstructed a 3D mesh model of the Lecture Hall at SNU from images captured using a droneAnalyzed conditions leading to poor 3D reconstruction outcomes, emphasizing the need for methods that address the limitations of real-world data collection	
[P4] Department Office Chatbot	May. 2024
<ul style="list-style-type: none">Developed an administrative support chatbot using RAG with the Meta-Llama-3-8B-Instruct modelIntegrated a diffusion model to provide contextualized responses with enhanced user experience	
[P5] Avatar Texture Enhancement via 3D Patch-wise Loss	Sep. 2023 – Dec. 2023
<ul style="list-style-type: none">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	

AWARDS AND SCHOLARSHIPS

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

SKILLS

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