Seunghun Oh

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Education

Seoul National University (SNU) *Mar 2020 – Aug 2025*
*BS in **Mechanical Engineering**, Double Major in **Computer Science***

- **GPA: 3.94/4.0**, **Major GPA: 3.97/4.0** *Top 3.8% (8th of 207, Mechanical Engineering, SNU)*
- 21 months of military service included

Gyeonggi Science High School for the Gifted (GSHS) *Mar 2017 - Feb 2020*
*Major in **Physics** and **Mathematics***

- 1 Year Early Entrance

Research Interests

- Robot Perception — localization, SLAM, and 3D reconstruction
- Multi-Sensor Fusion — LiDAR–camera–IMU integration for robust perception
- Toward Autonomous Robotic Systems — scene understanding, decision-making, and reliable operation

Publications

- H. Song, D. Lee, **S. Oh**, M. Jung, and A. Kim*
  "The City That Never Settles: Simulation-based LiDAR Dataset for Long-term Place Recognition under Extreme Structural Changes"
  Proceedings of the IEEE International Conference on Robotics and Automation (ICRA) Workshop, 2025.
  Best Paper Award arXiv:2505.05076
- **S. Oh**‡, Y. Kim‡, C. Song, and A. Kim*
  "LiDAR Data Processing Algorithm for Robust 6-DoF Estimation Using Circular Patterns"
  Journal of the Korean Robotics Society (KROS), June 2025. KROS Journal Link
- S. Hahn‡, **S. Oh**‡, M. Jung, A. Kim*, and S. Jung
  "Quantitative 3D Map Accuracy Evaluation Hardware and Algorithm for LiDAR (-Inertial) SLAM"
  Proceedings of the International Conference on Control, Automation and Systems (ICCAS), 2024. arXiv:2408.09727

Selected Awards and Honors

Scholarships / Fellowships

- **The National Presidential Science Scholarship**, Korea Student Aid Foundation 2024 – 2025
  Full tuition plus $3700 each year for honorable undergraduates from the Korean government (4 semesters)
- **Work-Study Scholarship** (*Value Exploration and Practice*), Seoul National University Mar 2025 – Nov 2025
  Financial support of $1500 for the work on the student society
- **Work-Study Scholarship** (Type 1), Seoul National University Mar 2024 – Nov 2024
  Financial support of $2200 for the work on the student society
- **Merit-based Scholarship**, Dept. of Mechanical Engineering, Seoul National University Spring – Fall 2021

Awards and Honors

- 2025 – Co-authored ICRA 2025 workshop paper [1]; awarded **Best Research Award** (1st Place), IEEE ICRA Workshop on Future of Construction
- 2025 – **Outstanding Undergraduate Research Opportunities Program Award**, Dept. of Mechanical Engineering, Seoul National University
- 2024 – **Grand Prize**, Mechatronics Competition
- 2022 – **Winner**, Startup Camp hosted by Hanbat University (During Military Service)
- 2021 – Academic Honor: Highest GPA in 2nd Semester (4.3/4.3)
- 2018 – **Training Lineup for IPhO (International Physics Olympiad)**
- 2018 – **Winner**, SNU Youth Engineering Frontier Camp

Research Experiences

Undergraduate Researcher, SNU-VGI Lab (Advisor: Prof. Jaesik Park) *Seoul, Korea*
Seoul National University *Sep 2025 – now*

- **Semantic Understanding in 3D Scene Representations**
  Investigating vision-language models (e.g., CLIP) for semantics in 3D scenes, referencing works like Feature 3DGS and LangSplat.

Undergraduate Researcher, RPM Robotics Lab (Advisor: Prof. Ayoung Kim) *Seoul, Korea*
Seoul National University *Dec 2023 – Aug 2025*

- **3D Reconstruction with SDF-based Sparse Voxel Rasterization**
  Developed an SDF-based voxel rasterization pipeline to enhance mesh accuracy, extending SVRaster's architecture. Focused on geometry refinement and enforcing voxel-wise continuity using CUDA and PyTorch.
  → Open-source Project
- **Long-term Place Recognition using Simulated LiDAR Datasets**
  Adapted and implemented long-term loop closure algorithms (Scan Context, BTC, Solid) in simulated urban environments. Evaluated PR performance under structural changes with customized pipelines.
- **LiDAR–Camera Calibration via Circular Marker Detection**
  Developed the first robust LiDAR-based framework for accurate 6-DoF pose estimation using circular patterns, later integrated with the *DiscoCal (CVPR)* framework to complete a LiDAR–camera calibration system.
  → Open-source Project
- **Quantitative Evaluation of 3D SLAM Map Accuracy**
  Designed experimental setups and metrics for evaluating LiDAR(-inertial) SLAM accuracy. Developed benchmarking tools for 3D map reconstruction quality comparison. → Open-source Project

Research Student, Aerospace Engineering Club (Bulnabi) *Seoul, Korea*
Seoul National University *Dec 2023 – Apr 2024*

- Built foundational robotics environment using Ubuntu and ROS
- Simulated drone operations with Gazebo and QGroundControl

Research Student, Mechanical Engineering Club (ZERO) *Seoul, Korea*
Seoul National University *Mar 2020 – Aug 2020*

- Experienced with C++ and Linux programming for autonomous driving and other robotics applications

Presentations / Talks

- Poster Presentation, "LiDAR Data Processing Algorithm for Robust 6-DoF Estimation Using Circular Patterns" Presented at KROS Spring Conference, Gangwon, Korea, 2025
- Seminar Talks, "Introduction to Linux","Drone software & simulation" "Introduction to ROS" link
  Robotics Club Seminar, Seoul National University, 2024

Leadership / Extracurricular Activities

Republic of Korea Air Force (ROKAF) Seoul, Korea
Sergeant, 15th Air Force Base, 256th Squadron Mar. 2022 – Dec. 2023

- Served as squad leader, supervising 10 airmen in daily operations and training
- Managed Confidential Level II documents and coordinated flight schedules with pilots
- Ensured operational readiness and safety at the 256th Squadron, 15th Air Force Base

Mentoring Volunteer Program Andong, Korea
Sports day and physics team leader Jan. 2025 – Feb. 2025

- Led a team project organizing physics lessons and extracurricular science sessions for high school students
- Guided hands-on experiments and provided STEM mentoring for underserved students

Skills

Programming: C++, C, Java, Python, MATLAB, RISC-V Assembly, Bluespec
Libraries/Softwares: Pytorch, CUDA, ROS1-2, Arduino, Fusion360, LaTeX