

Seunghwan Lee

Ph.D. Student in Computer Science and Engineering
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RESEARCH INTERESTS

- **Shape Matching:** Spherical Deformation, Registration
- **Shape Segmentation:** Parcellation, Sulcal Labeling
- **Geometric Deep Learning:** Computational & Differential Geometry
- **Spectral Shape Analysis:** Spherical Harmonics, Equivariance
- **Acceleration:** GPGPU, CUDA

EDUCATIONS

- | | |
|---|------------------------------------|
| Pohang University of Science and Technology (POSTECH)
Combined M.S./Ph.D. Program in Computer Science and Engineering
– Advisor: Dr. Ilwoo Lyu | Pohang, KR
Mar. 2024 – Present |
| Ulsan National Institute of Science and Technology (UNIST)
B.S. in Computer Science and Engineering | Ulsan, KR
Mar. 2017 – Feb. 2024 |
| Ulsan National Institute of Science and Technology (UNIST)
B.S. in Mechanical Engineering
– Thesis: “Accelerated Registration/Upsampling Method using 4D Transformation Tensor” | Ulsan, KR
Mar. 2017 – Feb. 2024 |

- [1] Seungeun Lee*, Seunghwan Lee*, Sunghwa Ryu, and Ilwoo Lyu, “Spharm-reg: Unsupervised cortical surface registration using spherical harmonics”, *IEEE Transactions on Medical Imaging*, vol. 44, no. 11, pp. 4732–4742, 2025, *: **Equal Contribution**.
- [2] Seunghwan Lee, Jiwon Son, Seungeun Lee, Ethan H. Willbrand, Benjamin J. Parker, Kevin S. Weiner, and Ilwoo Lyu, “Extensive spherical region enlargement with isotropic deformation for sulcal labeling”, in *2025 IEEE 22nd International Symposium on Biomedical Imaging (ISBI)*, IEEE, Apr. 2025, pp. 1–5.
- [3] Byungcheon Yoo*, Chaeyeong Ryu*, Seunghwan Lee*, Sanggyun Jeong*, Younghoon You, Dahye Baek, Dowon Kim, Inkyu Jeon, Ki-Seok An, Jongwon Oh, and Jiseok Lee, “High-throughput multiplexed plasmonic color encryption of microgel architectures via programmable dithering-mask flow microlithography”, *Advanced Materials*, vol. 37, no. 16, p. 2405388, 2025, *: **Equal Contribution**.
- [4] Seungeun Lee, Seunghwan Lee, Ethan H. Willbrand, Benjamin J. Parker, Silvia A. Bunge, Kevin S. Weiner, and Ilwoo Lyu, “Leveraging input-level feature deformation with guided-attention for sulcal labeling”, *IEEE Transactions on Medical Imaging*, vol. 44, no. 2, pp. 915–926, 2025.
- [5] Seungeun Lee*, Sunghwa Ryu*, Seunghwan Lee, and Ilwoo Lyu, “Unsupervised learning of cortical surface registration using spherical harmonics”, in *International Workshop on Shape in Medical Imaging*, Springer, 2023, pp. 65–74, *: **Equal Contribution**.

SCHOLARSHIPS AND GRANTS

- **OK Bae & Jung Scholarship** (13rd, \$ 60,000) Sep. 2024 – Present
- **Graduate Student Research Grant** (National Research Foundation) Jul. 2024 – Jun. 2025
 - **Topic:** Smooth Enlargement of Cortical Sulci Regions of Interest using Large Deformation and Optimization of Tessellation Algorithm using Accelerator
- **UNIST Academic Performance Scholarship** (Full Scholarship) Mar. 2017 – Feb. 2024
- **Ulsan Research Institute Scholarship** (Academic Excellence) Dec. 2023

AWARDS AND HONORS

- UNIST Commencement (Valedictorian Speech) Feb. 2024
- Talent Award of Korea (Deputy Prime Minister and Minister of Education Award) Dec. 2023
- **X-corps+ Festival** (5th Place, Chairman of X-Corps+ IFRP Award) Nov. 2023
- **The 3rd U-Challenge Festival** (3rd Place, President of UNIST Award) Nov. 2023
- **The 8th Science and Public Safety Idea Contest** (3rd Place, President of KNPU Award) Oct. 2022
- **LG Electronics H&A Growth Hacking Contest** (Vice President of LG Electronics Award) May. 2022
- **Stop Covid-19 SW Challenge Idea Hackathon** (1st Place) Apr. 2022
- The 7th Science and Public Safety Idea Contest (1st Place, Minister of Science and ICT Award) Oct. 2021
- **The 7th Korea SW Convergence Hackathon Competition** (2nd Place, Mayor of Ulsan Award) Dec. 2020
- **The 3rd Dream Share Medical Hackathon** (2nd Place, President of Ulsan University Hospital Award) Nov. 2019
- **SPLASH Startup Idea Discovery Hackathon** (2nd Place, Presidents of 4-Port Authority Award) Sep. 2019
- **Rotman-UNIST Trading Competition** (Overall 1st Place) Aug. 2019
- **Rotman-UNIST Trading Competition** (3rd Places for Algorithmic Statistical Arbitrage & XAIC ETF) Aug. 2018

Ulsan National Institute of Science and Technology (UNIST) Undergraduate Researcher in 3D Shape Analysis Lab.	Ulsan, KR Dec. 2022 – Feb. 2024
Ulsan National Institute of Science and Technology (UNIST) Undergraduate Researcher in Industry-Friendly Research Program (Brain to Society)	Ulsan, KR Mar. 2023 – Dec. 2023
AmHolo Researcher in Computer Vision for Anti-counterfeiting Coloration Technology	Ulsan, KR Jan. 2023 – Nov. 2023
Republic of Korea Auxiliary Police Served Military Duty in Public Order Security Service (POSS)	Busan, KR Feb. 2021 – Aug. 2022
Cybernetics Imaging Systems Research Director in R&D Center	Ulsan, KR Sep. 2019 – Sep. 2020
Ulsan National Institute of Science and Technology (UNIST) Undergraduate Researcher in Cybernetics Lab.	Ulsan, KR Aug. 2019 – Sep. 2019

PATENTS

- Dongjun Kim*, Chiyoung Je*, **Seunghwan Lee***, “Finger joint position estimation system using single camera image analysis and the method therefore” (Application No. 10-2023-0028355, Publication No. 10-2024-0135170), ***: Equal Contribution.**

TEACHING

- **Teaching Assistant** in Pohang University of Science and Technology
CSED703M: 3D Medical Image Processing and Analysis Spring 2026
- **Teaching Assistant** in Pohang University of Science and Technology
CSED233: Data Structures Fall 2024
- **Teaching Assistant** in POSCO Youth AI-Big Data Academy 26th
Computer Vision Summer 2024
- **Teaching Assistant** in Ulsan National Institute of Science and Technology
BME28301: Introduction to Biomedical Imaging Fall 2023