

Haejoon Lee

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RESEARCH INTERESTS

Computer Vision and Computational Imaging

EDUCATION

2023 - present	Carnegie Mellon University , Pittsburgh, USA Ph.D. in Electrical and Computer Engineering Advisors: Aswin C. Sankaranarayanan and Vijayakumar Bhagavatula	
2022 - 2023	Carnegie Mellon University , Pittsburgh, USA MS in Electrical and Computer Engineering	GPA: 4.0/4.0
2015 - 2021	Yonsei University , Seoul, South Korea BSE in Electrical and Electronic Engineering	GPA (last three semesters): 4.0/4.0 GPA (total): 3.7/4.0

WORK EXPERIENCE

Carnegie Mellon University <i>Graduate Student Researcher</i> in Image Science Lab	Aug 2022 - Present
Yonsei University <i>Undergraduate Student Researcher</i> in Medical Imaging Lab (Advisor: Dong-Hyun Kim) Project: Deep learning technique for detecting cerebral microbleeds in MRI data	Jan 2021 - July 2022
Bukhan Mountain Rescue Police Team Served military duty as a <i>mountain rescuer</i>	Jun 2017 - Jun 2018

PUBLICATIONS

Full-length articles

- [1] **Haejoon Lee** and Aswin C Sankaranarayanan. “Spectral Subsurface Scattering for Material Classification”. In: *European Conference on Computer Vision (ECCV)*. Springer. 2025, pp. 108–124. DOI: https://doi.org/10.1007/978-3-031-72652-1_7.
- [2] Julian Leron, **Haejoon Lee**, Soumya Kar, and Aswin C. Sankaranarayanan. “Computational Imaging for Long-Term Prediction of Solar Irradiance”. In: *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)* (2024). Under review. eprint: <https://arxiv.org/abs/2409.12016>.
- [3] **Haejoon Lee** et al. “Detection of cerebral microbleeds in MR images using a single-stage triplanar ensemble detection network (TPE-Det)”. In: *Journal of Magnetic Resonance Imaging (JMRI)* 58.1 (2023), pp. 272–283. DOI: [10.1002/jmri.28487](https://doi.org/10.1002/jmri.28487).
- [4] Jun-Ho Kim, Young Noh, **Haejoon Lee**, Seul Lee, Woo-Ram Kim, Koung Mi Kang, Eung Yeop Kim, Mohammed A. Al-masni, and Dong-Hyun Kim. “Toward Automated Detection of Microbleeds with Anatomical Scale Localization Using Deep Learning”. In: *Medical Image Analysis* (2024), p. 103415. ISSN: 1361-8415. DOI: <https://doi.org/10.1016/j.media.2024.103415>.

Peer-reviewed abstracts

- [1] **Haejoon Lee**, Mohammed A. Al-masni, Jun-Ho Kim, Seul Lee, Kyu-Jin Jung, Woo-Ram Kim, Young Noh, and Dong-Hyun Kim. “Triplanar Ensemble Detection Network (TPE-Det): A Single End-to-End Model for Efficient Detection of Cerebral Microbleeds in MR Images (ISMRM 2022)”. In: *2022 Joint Annual Meeting ISMRM-ESMRMB & SMRT 31st Annual Meeting*. **Oral Presentation**.
- [2] **Haejoon Lee**, Mohammed A. Al-masni, Seul Lee, Kyu-Jin Jung, Woo-Ram Kim, Young Noh, and Dong-Hyun Kim. “Automated Detection of Cerebral Microbleeds in MR Images: 3-plane Multiview Detection”. In: *The 9th International Congress on Magnetic Resonance Imaging & 26th Annual Scientific Meeting of KSMRM (ICMRI 2021)*. **Awarded 1st Prize among Oral Presentations**.
- [3] Jun-Ho Kim, **Haejoon Lee**, Kyu-Jin Jung, Mohammed A. Al-masni, and Dong-Hyun Kim. “Cerebral Microbleeds Detection Using a 3D Feature Fused Region Proposal Network with Hard Sample Prototype Learning”. In: *25th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI 2022)*.
- [4] Jun-Ho Kim, Mohammed A. Al-masni, **Haejoon Lee**, Kyu-Jin Jung, and Dong-Hyun Kim. “A Single-stage Detector of Cerebral Microbleeds Using 3D Feature Fused Region Proposal Network (FFRP-Net)”. In: *International Conference on Artificial Intelligence Circuits and Systems (AICAS 2022)*.
- [5] Sanghyeok Choi, Seul Lee, **Haejoon Lee**, Kyu-Jin Jung, and Dong-Hyun Kim. “3D Multi-echo GRE Motion Detection by k-space Anomaly Detection”. In: *The 9th International Congress on Magnetic Resonance Imaging & 26th Annual Scientific Meeting of KSMRM (ICMRI 2021)*.

PATENTS

Haejoon Lee, Dong-Hyun Kim, and Young Noh, “CEREBRAL MICROBLEED DETECTION METHOD AND LEARNING METHOD FOR CEREBRAL MICROBLEED DETECTION” Applicant: Yonsei University Industry-Academic Cooperation Foundation (80%), Gachon University Industry-Academic Cooperation Foundation (10%), Gil Medical Foundation (10%).
Application No.: 10-2021-0165008, Application Date: November 26, 2021

AWARDS AND HONORS

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| Presidential Fellowship funded by a Tata Consulting Services (TCS) gift | 2024 |
| Covers tuition and stipend for the 2024-2025 academic year at Carnegie Mellon University. | |
| The Korean Government Scholarship Program for Study Overseas | 2023 |
| Selected as one of the five Korean students in the digital field. | |
| Best Scientific Awards [1st] - Oral Presentation | 2021 |
| Awarded 1st prize among oral presentation in ICMRI 2021. | |
| Academic Excellence Scholarship | 2021 |
| Yonsei University, Seoul, Korea | |
| High Honors | 2020 |
| Ranked in the top 3% of undergraduate students in the EEE department at Yonsei University, Seoul, Korea. | |

SKILLS

Programming

- Languages: Python, MATLAB
- Libraries: OpenCV, PyTorch, NumPy, Pandas, sklearn, matplotlib

SERVICES

Reviewer

- CVPR (2024), Transactions on Computers

Teaching Experiences

- Graduate Thesis Teaching Assistant (TA), Yonsei University, 2021

GRADUATE COURSEWORK

10725	Convex Optimization	Spring 2024
15862	Computational Photography	Fall 2023
18752	Estimation, Detection, and Learning	Spring 2023
18786	Introduction to Deep Learning	Spring 2023
18793	Image and Video Processing	Fall 2022
16720	Computer Vision	Fall 2022