Hyeokjin Kwon

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Education

03.2019 - 08.2024 **Ph.D. Electronic Engineering** at Hanyang University, Seoul, South Korea
03.2013 - 02.2019 **B.S. Biomedical Engineering** at Hanyang University, Seoul, South Korea

Employment History

11.2024 - present **Research Fellow** at Boston Children's Hospital & Harvard Medical School, Boston, MA, United States
02.2023 - 08.2023 **Visiting Scholar** at Boston Children's Hospital & Harvard Medical School, Boston, MA, United States

Research Interests

Medical Image Analysis, Graph Neural Networks, Generative AI

Passionate about tackling issues in medical data, I aim to harness the power of machine learning to solve diverse challenges. I'm fascinated by how technology can be fine-tuned to improve specific tasks within this field.Passionate about tackling issues in medical data, I aim to harness the power of machine learning to solve diverse challenges. I'm fascinated by how technology can be fine-tuned to improve specific tasks within this field.

Publications

⋆ indicates co-first authorship

Sung Jun Ahn, **Hyeokjin Kwon**⋆, Jin-Ju Yang, Mina Park, Yoon Jin Cha, Sang Hyun Suh, and Jong-Min Lee. "Contrast-Enhanced T1-Weighted Image Radiomics of Brain Metastases May Predict EGFR Mutation Status in Primary Lung Cancer." **Scientific Reports, 2020**.

Hyeokjin Kwon, Jun Won Kim, Mina Park, Jin Woo Kim, Minseo Kim, Sang Hyun Suh, Yoon Soo Chang, Sung Jun Ahn and Jong-Min Lee. "Brain Metastases From Lung Adenocarcinoma May Preferentially Involve the Distal Middle Cerebral Artery Territory and Cerebellum." **Frontiers in Oncology, 2020**.

Hyun Ju Lee, **Hyeokjin Kwon**⋆, Johanna Inhyang Kim, Joo Young Lee, Ji Young Lee, SungKyu Bang, and Jong-Min Lee. "The Cingulum in Very Preterm Infants Relates to Language and Social-Emotional Impairment at 2 Years of Term-Equivalent Age ." **NeuroImage: Clinical, 2021**.

Han Soo Yoo, **Hyeokjin Kwon**⋆, Seok Jong Chung, Young H. Sohn, Jong-Min Lee and Phil Hyu Lee. "Neural Correlates of Self-Awareness of Cognitive Deficits in Non-Demented Patients with Parkinson's Disease." **European Journal of Neurology, 2021**.

Sung Jun Ahn, **Hyeokjin Kwon**⋆, Jun Won Kim, Goeun Park, Mina Park, Bio Joo, Sang Hyun Suh, Yoon Soo Chang, and Jong-Min Lee. "Hippocampal Metastasis Rate Based on Non-Small Lung Cancer TNM Stage and Molecular Markers." **Frontiers in Oncology, 2022**.

Hyeokjin Kwon, Johanna Inhyang Kim, Seung-Yeon Son, Yong Hun Jang, Bung-Nyun Kim, Hyun Ju Lee and Jong-Min Lee. "Sparse Hierarchical Representation Learning on Functional Brain Networks for Prediction of Autism Severity Levels." **Frontiers in Neuroscience, 2022**.

Hyeokjin Kwon, Seonggyu Kim, Jihye Ha, Eun Jung Baek, and Jong-Min Lee. "Visual Representation Learning Using Graph-Based Higher-Order Heuristic Distillation for Cell Detection in Blood Smear Images." **Intelligent Systems with Applications, 2024**.

Hyeokjin Kwon, Sungmin You, Hyuk Jin Yun, Seungyoon Jeong, Anette Paulina De León Barba, Marisol Elizabeth Lemus Aguilar, Pablo Jaquez Vergara, Sofia Urosa Davila, P. Ellen Grant, Jong-Min Lee, and Kiho Im. "The Role of Cortical Structural Variance in Deep Learning-Based Prediction of Fetal Brain Age" **Frontiers in Neuroscience, 2024**.

Patents

Domestic

KR 10-27420640000 (published in 12.2024)	Method and device for analyzing human brain networks
KR 10-2024-0032115 (filed in 03.2024)	Self-supervised framework using higher-order heuristic distillation for visual representation learning

International

PCT/KR2024/096956 (filed in 12.2024)	Self-supervised framework using higher-order heuristic distillation for visual representation learning

Skills

Computer languages/Software	**Python, Matlab, and Bash**
Brain MRI pre-processing	(Contrast-enhanced) T1-, and T2-weighted structural imaging, Fluid Attenuation Inversion Recovery (FLAIR), Diffusion Weighted Imaging (DWI), resting state-functional MRI (rs-fMRI), PET
Analysis	**Morphology analysis** (Cortical thickness, voxel-based, tract-based, etc), **connectivity-based analysis** (seed-based, network measurements, dynamic time-resolved network, probabilistic networks), **cortical surface-based analysis**, and **group analysis** (deterministic/inference statistics, parametric/non-parametric)
Machine learning	**Machine-learning methods** (random forest, SVM, regression models, etc), and it's implementation (Scikit-learn,Brain Connectivity Tool). **Deep-learning methods** (CNN, GNN, Transformer, and generative models, GAN, Diffusion probabilistic models), and its implementation (Pytorch, Tensorflow)