JI YOUNG BYUN

jy030814@gmail.com · (+82)-10-3236-7068 · Republic of Korea
https://jiyoungbyun.github.io/

RESEARCH INTEREST

· Developing deep-learning frameworks for computer-aided diagnosis system.
· Integrating heterogeneous medical data for translational research.

EDUCATION

KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY (KAIST)   Daejeon, Korea
M.S. in Department of Bio and Brain Engineering (Converted GPA: 4.0/4.0)   2021

· Thesis: Graph Neural Network (GNN) for Predicting Alzheimer's Disease (AD)
      Developed a GNN approach, utilizing approximate personalized propagation of neural predictions, to predict AD by incorporating resting-state functional MRI (rs-fMRI) and demographic measures.

KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY (KAIST)   Daejeon, Korea
B.S. in Department of Bio and Brain Engineering (Converted advanced GPA: 3.7/4.0)   2018

SCHOLARSHIP

The Korean Government Scholarship Program for Study Overseas   Sep 2022 - Aug 2024
Financial support ($40,000/year) for the Ph.D. study from the Korean Government

PUBLICATIONS

1. **Byun, J.**, & Jeong, Y. (2021). Graph neural network-based heterogeneous propagation scheme for classifying Alzheimer's disease using resting-state fMRI and demographic measures. *bioRxiv. (Submitted to Journal of IEEE Biomedical and Health Informatics)*

2. Park, H., Kam, T. I., Peng, H., Mehrabani-Tabari, A. A., Chou, S. C., Karuppagounder, S. S., Umanah, G. K., Chang, S., Kim. H., **Byun, J.**, Liu, J. O., Dawson, T. M., & Dawson, V. L. (2020) Therapeutic potential of PAAN inhibition for Parkinson's disease. *Cell*. (*Under final revision*)

3. Kang, Y. T., Doh, I., **Byun, J.**, Chang, H. J., & Cho, Y. H. (2017). Label-free rapid viable enrichment of circulating tumor cell by photosensitive polymer-based microfilter device. *Theranostics*, 7(13), 3179.

PRESENTATIONS

1. **Byun, J.**, & Jeong, Y. (2020, November 14). The impact of SNPs on Alzheimer's disease classification based on resting-state fMRI. Korea Dementia Association. Virtual.

2. **Byun, J.**, & Jeong, Y. (2020, November 6). Classification of Alzheimer's disease based on resting-state functional MRI and SNPs. Korean Human Brain Mapping Conference. Virtual.

3. **Byun, J.**, & Jeong, Y. (2020, November 3-4). Graph neural network approach for classification of Alzheimer's disease using resting-state fMRI. Asian Society of Magnetic Resonance in Medicine & International Congress on MRI 2020. Virtual. **(Best Poster Award)**

4. **Byun, J.**, & Jeong, Y. (2020, June 23-July 3). Automated multi-class classification of Alzheimer's disease with attributed network embedding. Organization for Human Brain Mapping Conference. Virtual.

5. **Byun, J.**, & Jeong, Y. (2019, November 1). Automated multi-class classification of Alzheimer's disease with attributed network embedding. Korean Human Brain Mapping Conference.

RESEARCH EXPERIENCE

LABORATORY FOR COGNITIVE NEUROSCIENCE & NEUROIMAGE   Daejeon, Korea
Researcher—Supervisor: Yong Jeong, MD, Ph.D.   Feb 2019 - Present
· Implementing self-supervised learning to predict amyloid positivity with incomplete data.
· Developed GNN framework to classify AD with rs-fMRI and demographic measures.
· Analyzed rs-fMRI of Parkinson's disease patients to verify the Donepezil's effects on memory loss.

INSTITUTE FOR BASIC SCIENCE FOR COGNITION AND SOCIALITY Daejeon, Korea
Researcher—Supervisor: Do-yun Lee, Ph.D. Sep 2016 - Feb 2018
· Implemented in vivo two-photon calcium imaging to research social information processes.
· Programmed through MATLAB to interpret neuronal patterns at the network and cellular levels.

JOHNS HOPKINS UNIVERSITY Baltimore, MD
Research Intern—Supervisor: Valina Dawson, Ph.D. Jun 2016 - Aug 2016
· Characterized the effects of the inhibition of AIMP2 phosphorylation on Parkinson's disease symptoms.
· Conducted cellular analysis of dopamine neurons and behavioral tests on mice injected with PFF.

NANOSENTUATING SYSTEMS LABORATORY, KAIST Daejeon, Korea
Research Assistant—Supervisor: Young-ho Cho, Ph.D. Sep 2015 - Jun 2016
· Examined the genetic expression of captured circulating tumor cells (CTCs) in human blood samples.
· Isolated CTCs and rare cell RT-qPCR with fabricated filters to identify genetic markers expressed.

TRANSLATIONAL NEUROGENETICS LABORATORY, KAIST Daejeon, Korea
Research Assistant—Supervisor: Jung-ho Lee, MD, Ph.D. Jun 2015 - Aug 2015
· Investigated the role of primary cilia in neuronal cells of Joubert syndrome patients.
· Created a Tmem138 knockout mouse model using Cre-loxP recombination and in utero electroporation.

CELL SIGNALING AND BIO IMAGING LABORATORY, KAIST Daejeon, Korea
Research Assistant—Supervisor: Chul-hee Choi, MD, Ph.D. Mar 2015 - Jun 2015
· Identified which optimized *ginsenoside* substance for treating breast cancer in mouse models.
· Employed Doxorubicin as a control to compare its medicinal effects with the *ginsenoside* substances.

POSTECH-CATHOLIC UNIVERSITY BIOMEDICAL ENGINEERING INSTITUTE Daejeon, Korea
Research Intern Dec 2014 - Feb 2015
· Organized methods to treat brain tumors by using mesenchymal stem cells.

NANOENTEK Seoul, Korea
Research Intern Jan 2014 - Feb 2014
· Developed lab-on-a-chip diagnostic tool for AD with various metrics including TSH level.

HONORS & AWARDS

KAIST-KT Joint Research Project — $85,000 a year research grant	2021 - 2024
Best Poster Award — ASMRM & ICMRI 2020	2020
National Scholarship — 4 semesters	2019 - 2021
Best Tutor Awards — Global Institute for Gifted Education	2018
KAIST Scholarship — 8 semesters	2013 - 2017
National Science & Technology Scholarship — 4 semesters	2015 - 2017
Nationwide Nobel Prize Essay Contest — 3rd Place	2016
KAIST Scholarship for Research Internship	2016

TEACHING EXPERIENCE

KAIST, *Teaching Assistant* Mar 2019 - Dec 2020
· Prepared quizzes, teach experiment procedures and score reports for eight courses.

Global Institute for Gifted Education, *Tutor* Feb 2017 - Dec 2017
· Taught science and technology classes for gifted middle school students.
·
SAMSUNG Dream Class, *Mentor* Aug 2015 - Jun 2016
· Created and fostered opportunities for underserved and struggling students to enhance their education through teaching English classes twice a week.

VOLUNTEER ACTIVITIES

KAIST, *Counseling Mentor*   Sep 2019 - Dec 2020
·   Counseled undergraduate students to help them decide their career goals and relieve stress.

Saint Mary's Hospital, *Interpreter*   Apr 2018 - Dec 2018
·   Translated Korean to English for international patients and their families.

KAIST, *Student Mentor*   Feb 2016 - Feb 2017
·   Counseled freshman students at KAIST to help them successfully adapt to a new environment.

KAIST, *International Students Guide*   Mar 2014 - Jun 2014
·   Supported international students for a semester by helping them settle into life at KAIST.