Soomin Chung

Medical AI (AI for Health), Multi-modal learning, Reinforcement Learning

Seoul National University, Seoul, Republic of Korea

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Education

Seoul National University *Seoul, Republic of Korea*

M.S., Interdisciplinary Program of Bioengineering *Sep 2022 – Feb 2025*

- GPA: 4.27/4.5 (3.95/4.0)
- TOEFL: 102/120 (R 28/30, L 28/30, S 23/30, W 23/30)
- Advisor: Prof. Kwangsoo Kim, Prof. Hyung-Jin Yoon
- Thesis: Longitudinal ECG Analysis with Deep Learning for Improved Detection of Reduced Left Ventricular Ejection Fraction

EWHA Womans University *Seoul, Republic of Korea*

B.S., Mechanical and Biomedical Engineering; Minor in Computer Engineering *Mar 2018 – Aug 2022*

- GPA: 4.22/4.5 (3.83/4.0)
- Advisor: Prof. Taehoon Shin
- Thesis: AI Speaker–Based Integrated Psychological Counseling System for Children and Adolescents

Publications

[J4] Reinforcement learning model for optimizing dexmedetomidine dosing to prevent delirium in critically ill patients, npj Digital Medicine (SCIE, IF=15.1, JCR 2024 top 0.3%)

Hong Yeul Lee (MD), **Soomin Chung (MS)***, et al., Ho Geol Ryu, Hyeonhoon Lee (2024)*

[J3] A deep-learning algorithm using real-time collected intraoperative vital sign signals for predicting acute kidney injury after major non-cardiac surgeries: A modelling study, PLOS Medicine (SCIE, IF=9.9, JCR 2024 top 3.8%)

Sehoon Park (MD), **Soomin Chung (MS)***, et al., Kwangsoo Kim, Hajeong Lee (2025)*

[J2] (in revision) Deep-learning-based volition detection and action potential extraction for fully automated diagnosis of neuromuscular disease using needle electromyography signals, IEEE-ACM Transactions on Computational Biology and Bioinformatics (SCIE, IF=3.4, JCR 2024 top 8.1%)

Soomin Chung (MS), Ilhan Yoo (MD)*, et al., Keewon Kim+, Seung-Bo Lee+ (2025)*

[C4] S3D: Sketch-Driven 3D Model Generation, GMCV Workshop at CVPR'25 (CVPRW 2025)

*Hail Song, Wonsik Shin, Naeun Lee, **Soomin Chung**, Nojun Kwak, Woontack Woo (2025)*

[J1] Prediction of reduced left ventricular ejection fraction using atrial fibrillation or flutter electrocardiograms: A machine-learning study, Digital Health (SCIE, IF=3.3)

Soonil Kwon (MD), **Soomin Chung (MS)***, et al., So-Ryoung Lee, Kwangsoo Kim (2025)*

[C3] Integrated Counseling System for child, KCSE 2022

Sua Kim, Yebin Lee*, **Soomin Chung***, et al., Taehoon Shin (2022)*

[C2] Machine Learning Approaches as An Alternative to Human Psychophysical Tests of Prosthetic Vision, IEEE EMBC 2021

*Na Min An, Hyeonhee Roh, **Soomin Jung**, et al., Maesoon Im (2021)*

[C1] Neural information of artificial vision varies depending on the level of spiking heterogeneity across retinal ganglion cells, ARVO 2021

*Hyeonhee Roh, Eunju Kim, **Soo Min Chung**, et al., Maesoon Im (2021)*

J: Journal, C: Conference/Workshop
(: Equal contribution)*

Patents

Method and Apparatus for Drug Adjustment for Delirium Prevention, Korean Patent Application 10-2023-0138995

*Hyeonhoon Lee, **Soomin Chung**, Hong Yeul Lee (2023)*

Research Experience

Carnegie Mellon University *Pittsburgh, USA*

Visiting Scholar, School of Computer Science *Aug 2024 – Feb 2025*

- Developed S3D, a framework for generating high-fidelity 3D models from simple sketches
- Autonomous Targeting AI Cannon: Developed an autonomous targeting system using NVIDIA Jetson Nano and YOLO v11s
- Enhanced a Medical Visual Question Answering model by replacing the classification head with a generative layer

Bio–Medical Informatics (BMI) Lab, Seoul National University *Seoul, Korea*

Advisor: Prof. Kwangsoo Kim *Jan 2022 – Feb 2025*

- Applied deep learning and reinforcement learning to clinical decision support across diverse applications, including drug dosing optimization, acute kidney injury prediction, heart failure risk assessment from ECG, neuromuscular disease diagnosis from EMG, and longitudinal ECG analysis.

Im Vision Lab, Brain Science Institute, Korea Institute of Science and Technology *Seoul, Korea*

Advisor: Prof. Maesoon Im *Sep 2020 – Feb 2021*

- Developed machine learning approaches as alternatives to human psychophysical testing for artificial vision evaluation
- Investigated the impact of retinal ganglion cell firing diversity on neural information processing in artificial vision

Work Experience

Driving Safety Evaluation Division, KCWI Inc. *Seoul, Korea*

Freelance Data Analyst *Feb 2021 – Feb 2022*

- Statistical analysis of railway vehicle data for Korea Railroad Corporation type approval, resulting in over 20 certifications

Awards & Fellowships

Aug 2024	**Carnegie Mellon University AI Intensive Training Program Fellowship**, Institute of Information & Communications Technology Planning & Evaluation (IITP) *Selected as one of 30 fellows nationwide; full support of tuition and living expenses*	*45,000 USD*
May 2024	**2nd Place, SNU x Upstage LLM Project Hackathon**, Seoul National University	
Sep 2022	**Academic Excellence Scholarship**, Seoul National University	
Jan 2021	**Woonhae Scholarship Foundation**, 8th Cohort	*3,800 USD per semester*
Dec 2021	**Silver Award, Engineering Capstone Design Contest**, EWHA Womans University	
Feb 2020	**Academic Excellence Scholarship (Top 2%: 2020-1, Top 6%: 2019-2, 2020-2)**, EWHA Womans University	

Leadership & Service

Mar 2024 – Apr 2024	**Organizing Committee Data Lead,** CDM AI Challenge: Predicting Hypoxemia, Seoul National University Hospital, *Organized challenge with 200+ participants*
Jan 2021 – Dec 2021	**Vice President,** Young Engineers Honor Society (YEHS), National Academy of Engineering of Korea, *1 of 7 executive board members leading 1,600+ young engineering professionals and students nationwide*
Aug 2019 – Present	**Young Engineers Honor Society (YEHS),** National Academy of Engineering of Korea, *Selected as one of 3 distinguished EWHA Univ. students*

Skills

- Programming: Python, R, MATLAB (proficient); C++, C, Java (basic)
- Tools & Frameworks: PyTorch, scikit-learn, Scientific Python (NumPy, Pandas, Matplotlib), Git, Docker