

Hyungjin Chung

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Research interests Deep Learning, Diffusion models, Energy-based models,
Inverse problems, Computational Imaging, Compressed-sensing MRI

Education **KAIST** Daejeon, Korea
PhD in Bio & Brain Engineering 2021.03 – Present
Advisor: Professors Jong Chul Ye

KAIST Daejeon, Korea
MA in Bio & Brain Engineering 2019.03 – 2021.02
Thesis: [TomoGAN: Unsupervised Learning-based
Reconstruction of Tomography](#)
Advisor: Professors Jong Chul Ye

Korea University Seoul, Korea
BA in Biomedical Engineering 2015.03 – 2019.02

**Honors and
scholarships** **KAIST Scholarship** 2021.02 - Present
Korea Government Scholarship 2019.03 - 2021.02

**Professional
service** **Advisory board member** 2021.05 – Present
SNUHRad-AICON: SNUH-Radiology AI Collaboration Network

Journal reviewer
Medical Image Analysis, IEEE TMI, IEEE TCI, BMC bioinformatics, Medical
Physics, Scientific Reports, BMC pregnancy and childbirth

Conference reviewer
MIDL (2021)

Publications **Unsupervised Deep Learning Methods for Biological Image Recon-
struction and Enhancement**
Mehmet Akçakaya, Burhaneddin Yaman, [Hyungjin Chung](#), Jong Chul Ye,
IEEE SPM, 2021 (in press)

**A Deep Learning Model for Diagnosing Gastric Mucosal Lesions Using
Endoscopic Images: Development, Validation, and Method Compari-
son**

Joon Yeul Nam*, [Hyungjin Chung*](#), Kyu Sung Choi*, Hyuk Lee*,
Seung Jun Han, Tae Jun Kim, Hosim Soh, Eun Kang, Soo-Jeong Cho,
Jong Chul Ye, Jong Pil Im, Sang Gyun Kim, Yoon Jun Kim, Joo Sung Kim, Jung-
Hwan Yoon, Hyunsoo Chung, Jeong-Hoon Lee
*Gastrointestinal Endoscopy, 2021 (*First author)*

Feature Disentanglement in generating three-dimensional structure from two-dimensional slice with sliceGAN

[Hyungjin Chung](#), Jong Chul Ye
Nature Machine Intelligence, 2021

Missing Cone Artifacts Removal in ODT using Unsupervised Deep Learning in Projection Domain

[Hyungjin Chung*](#), Jaeyoung Huh*, Geon Kim, Yong Keun Park, Jong Chul Ye
IEEE Transactions on Computational Imaging

Two-Stage Deep Learning for Accelerated 3D Time-of-Flight MRA without Matched Training Data

[Hyungjin Chung](#), Eunju Cha, Leonard Sunwoo, Jong Chul Ye
Medical Image Analysis, 2021.

Deep learning STEM-EDX tomography of nanocrystals

Yoseob Han*, Jaeduck Jang*, Eunju Cha*, Junho Lee*, [Hyungjin Chung*](#),
Myoungho Jeong, Tae-Gon Kim, Byeong Gyu Chae, Hee Goo Kim, Shinae Jun,
Sungwoo Hwang, Eunha Lee, Jong Chul Ye
*Nature Machine Intelligence, 2021. (*First author)*
Selected as 2021 March Issue Cover

Unpaired training of deep learning tMRA for flexible spatio-temporal resolution

Eunju Cha, [Hyungjin Chung](#), Eung Yeop Kim, Jong Chul Ye.
IEEE Transactions on Medical Imaging, 2020.

Unpaired deep learning for accelerated MRI using optimal transport driven cycleGAN

Gyutaek Oh, Byeongsu Sim, [Hyungjin Chung](#), Leonard Sunwoo, Jong Chul Ye.
IEEE Transactions on Computational Imaging, 2020.

Preprints

Score-based diffusion models for accelerated MRI

[Hyungjin Chung](#) and Jong Chul Ye
arXiv preprint arXiv:2110.05243

Simultaneous super-resolution and motion artifact removal in diffusion-weighted MRI using unsupervised deep learning

Hyungjin Chung, Jaehyun Kim, Jeong Hee Yoon, Jeong Min Lee, Jong Chul Ye
arXiv preprint arXiv:2105.00240

International
Conference

Deep learning fast MRI using channel attention in magnitude domain

Joonhyung Lee*, Hyunjong Kim*, Hyungjin Chung*, Jong Chul Ye
IEEE International Symposium on Biomedical Imaging, 2020.
(*First author)

Unsupervised Merge-Residual Learning for Time-of-Flight MRI

Hyungjin Chung, Eunju Cha, Leonard Sunwoo, Jong Chul Ye
IEEE International Symposium on Biomedical Imaging Workshop, 2020.

Patent

Unsupervised deep learning method for tomography for complete removal of missing cone artifact and apparatus therefore

Jong Chul Ye, Hyungjin Chung, JaeYoung Huh
Korea patent application, 2020.

Two-Stage unsupervised learning method for 3D Time-of-flight MRA reconstruction and the apparatus therefore

Jong Chul Ye, Hyungjin Chung, Eunju Cha, Leonard Sunwoo
Korea patent application, 2020.

Research experience

Unsupervised deep learning for compressed sensing MRI reconstruction

KAIST 2020.04 – 2021.02
Research project conducted in collaboration with Seoul National University Bundang Hospital.

Deep learning-based performance prediction of deep learning

KAIST 2020.03 – 2021.02
Project presented in VRPGP 2020

Development of reconstruction algorithm of STEM-EDX tomography

Samsung Electronics 2019.12 – 2020.11

Teaching experience

Head Teaching assistant, KAIST Fall 2021

BiS 800: Machine Learning for Medical Image Analysis

Teaching assistant, KAIST

Spring 2021

BiS 301: Bioengineering Laboratory I

Teaching assistant, KAIST

Fall 2020

BiS 452: Biomedical Imaging

Teaching assistant, KAIST

Spring 2020

BiS 400, MAS 480 : Advanced Intelligence

Teaching assistant, KAIST

Fall 2019

BiS 452: Biomedical Imaging

Teaching assistant, KAIST

Spring 2020

BiS 301, : Bioengineering Laboratory I

Skills

Computational Imaging

- Compressed sensing MRI (CS-MRI)
- Computational tomography (CT)
- Inverse problems in vision
- Optical diffraction tomography (ODT)
- Microscopy
- Phase Retrieval

Deep Learning Framework

PyTorch, JAX, Tensorflow

Programming

Python, MATLAB, C++.