

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
Work Experience	Los Alamos National Laboratory	2022.06 – Present
	Research intern, Applied math & Plasma physics division (T-5) Host: Michael T. McCann, Marc Klasky	
Honors and scholarships	KAIST Scholarship	2021.02 - Present
	Korea Government Scholarship	2019.03 - 2021.02
Awards	2020, 2021 BISPL Best Researcher Award	2020, 2021.12
Invited talks	Diffusion models for inverse problems in imaging	2022.08
	LANL T-CNLS seminar, 2022	
	Deep learning-based MR reconstruction	2022.06
	45 th meeting, The Korean Society of Abdominal Radiology, 2022	
Professional Service	Advisory board member	2021.05 – Present
	SNUHRad-AICON: SNUH-Radiology AI Collaboration Network	
	Reviewer (selected)	
	IEEE TPAMI, IEEE TMI, IEEE TCI, Medical Image Analysis,	

Top ML conferences

Improving Diffusion Models for Inverse Problems using Manifold Constraints

Hyungjin Chung*, Byeongsu Sim*, Dohoon Ryu, Jong Chul Ye

Advances in Neural Information Processing Systems (NeurIPS), 2022

Come-Closer-Diffuse-Faster: Accelerating Conditional Diffusion Models for Inverse Problems through Stochastic Contraction

Hyungjin Chung, Byeongsu Sim, and Jong Chul Ye

IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2022

Publications

Low-dose sparse-view HAADF-STEM-EDX tomography of nanocrystals using unsupervised deep learning

Eunju Cha*, Hyungjin Chung*, Jaeduck Jang, Junho Lee, Eunha Lee, Jong Chul Ye

*ACS Nano, 2022 (*First author)*

Score-based diffusion models for accelerated MRI

Hyungjin Chung and Jong Chul Ye

Medical Image Analysis, 2021

Unsupervised Deep Learning Methods for Biological Image Reconstruction and Enhancement

Mehmet Akçakaya, Burhaneddin Yaman, Hyungjin Chung, Jong Chul Ye,

IEEE SPM, 2021

A Deep Learning Model for Diagnosing Gastric Mucosal Lesions Using Endoscopic Images: Development, Validation, and Method Comparison

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

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

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*,
Myoungcho Jeong, Tae-Gon Kim, Byeong Gyu Chae, Hee Goo Kim, Shinae Jun,
Sungwoo Hwang, Eunha Lee, Jong Chul Ye
Nature Machine Intelligence, 2021.

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

Progressive Deblurring of Diffusion Models for Coarse-to-Fine Image Synthesis

Sangyun Lee, Hyungjin Chung, Jaehyeon Kim, Jong Chul Ye
arXiv preprint arXiv:2207.11192

MR Image Denoising and Super-Resolution Using Regularized Reverse Diffusion

Hyungjin Chung, Eun Sun Lee, Jong Chul Ye
arXiv preprint arXiv:2203.12621

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.

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

Accelerating method of conditional diffusion models for inverse problems using stochastic contraction and the apparatus thereof

Jong Chul Ye, Hyungjin Chung, Byeongsu Sim

Korea patent application, 2021.

Score-based Diffusion Model for Accelerated MRI and Apparatus thereof

Jong Chul Ye, Hyungjin Chung

Korea patent application, 2021.

Task-agnostic image processing method and apparatus using transformer and federated split learning

Jong Chul Ye, Hyungjin Chung, Gyutaek Oh, Sangjoon Park, Boah Kim, Jeong-sol Kim

Korea patent application, 2021.

Crowd Deep Learning Method of Medical Artificial Intelligence and Apparatus thereof

Jong Chul Ye, Hyungjin Chung, Gyutaek Oh, Sangjoon Park

Korea patent application, 2021.

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	Teaching Assistant, KAIST	Fall 2022
	AI 619: AI for medical imaging and signals	
	Project leader, KAIST	Spring 2022
	AI 618: Generative models and unsupervised learning	
	Head Teaching assistant, KAIST	Fall 2021
	BiS 800: Machine Learning for Medical Image Analysis	
	Teaching assistant, KAIST	Spring 2021
	BiS 301: Bioengineering Laboratory I	
References	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	
References	Jong Chul Ye	2019.03 - current
	Thesis advisor (KAIST)	jong.ye@kaist.ac.kr
	Michael T. McCann	2022.06 - 2022.08
	Mentor (LANL)	mccann@lanl.gov
	Marc L. Klasky	2022.06 - 2022.08
	Mentor (LANL)	mklasky@lanl.gov