

# Hyungjin Chung

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Research interests	Generative models, Diffusion models, Inverse problems, Computational Imaging	
Work Experience	<b>NVIDIA Research</b>	2023.11 – Present
	Research Scientist Intern, AI4Science	
	<b>Google Research</b>	2023.07 – 2023.10
	Student Researcher, team LUMA (perception)	
	<b>Alphasignal</b>	2023.03 – Present
	Technical writer	
	<b>Los Alamos National Laboratory</b>	2022.06 – 2022.08
	Research intern, Applied math & Plasma physics (T-5)	
Education	<b>KAIST</b>	Daejeon, Korea
	Ph.D., Bio & Brain Engineering	2019.03 – 2025.02(expected)
	Advisor: Jong Chul Ye	
	<b>Korea University</b>	Seoul, Korea
	B.S., Biomedical Engineering	2015.03 – 2019.02
Awards	<b>29<sup>th</sup> Samsung Humantech Gold Award</b> (1st in signal Processing)	2023.2
	<b>2020-2022 BISPL Best Researcher Award</b>	2020-2022.12
Professional Service	<b>Research Advisor</b>	2023.07 – Present
	<i>Team Learners</i>	
	<b>Advisory board member</b>	2021.05 – Present
	<i>SNUHRad-AICON: SNUH-Radiology AI Collaboration Network</i>	
Conf. publication	<b>[C6]</b> Direct Diffusion Bridge using Data Consistency for Inverse Problems	
	<a href="#">Hyungjin Chung</a> , Jeongsol Kim, Jong Chul Ye	
	<i>NeurIPS 2023</i>	
	<b>[C5]</b> Improving 3D Imaging with Pre-Trained Perpendicular 2D Diffusion Models	
	Suhyeon Lee*, <a href="#">Hyungjin Chung</a> *, Minyoung Park, Jonghyuk Park, Wi-Sun Ryu, Jong Chul Ye	
	<i>ICCV 2023</i>	
	<b>[C4]</b> Score-based Diffusion Models for Bayesian Image Reconstruction	
	Michael T. Mccann, <a href="#">Hyungjin Chung</a> , Jong Chul Ye, Marc L. Klasky	
	<i>ICIP 2023</i>	
	<b>[C3]</b> Parallel Diffusion Models of Operator and Image for Blind Inverse Problems	
	<a href="#">Hyungjin Chung</a> *, Jeongsol Kim*, Sehui Kim, Jong Chul Ye	
	<i>CVPR 2023</i>	
	<b>[C2]</b> Diffusion Posterior Sampling for General Noisy Inverse Problems	
	<a href="#">Hyungjin Chung</a> *, Jeongsol Kim*, Michael T. Mccann, Marc L. Klasky, Jong Chul Ye	
	<i>ICLR 2023 (Notable-top-25%)</i>	
	<b>[C1]</b> Improving Diffusion Models for Inverse Problems using Manifold Constraints	
	<a href="#">Hyungjin Chung</a> *, Byeongsu Sim*, Dohoon Ryu, Jong Chul Ye	
	<i>NeurIPS 2022</i>	

[C0] Come-Closer-Diffuse-Faster: Accelerating Conditional Diffusion Models for Inverse Problems through Stochastic Contraction  
Hyungjin Chung, Byeongsu Sim, and Jong Chul Ye  
CVPR 2022

Workshop publication

[W0] Progressive Deblurring of Diffusion Models for Coarse-to-Fine Image Synthesis  
Sangyun Lee, Hyungjin Chung, Jaehyeon Kim, Jong Chul Ye  
NeurIPS Workshop on score-based methods (SBM), 2022

Journal publications

[J10] MR Image Denoising and Super-Resolution Using Regularized Reverse Diffusion  
Hyungjin Chung, Eun Sun Lee, Jong Chul Ye  
IEEE TMI, 2022

[J9] 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

[J8] Score-based diffusion models for accelerated MRI  
Hyungjin Chung and Jong Chul Ye  
Medical Image Analysis, 2021

[J7] Unsupervised Deep Learning Methods for Biological Image Reconstruction and Enhancement  
Mehmet Akçakaya, Burhaneddin Yaman, Hyungjin Chung, Jong Chul Ye  
IEEE SPM, 2021

[J6] 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\* et al.  
Gastrointestinal Endoscopy, 2021

[J5] Feature Disentanglement in generating three-dimensional structure from two-dimensional slice with sliceGAN  
Hyungjin Chung, Jong Chul Ye  
Nature Machine Intelligence, 2021

[J4] 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, 2021

[J3] 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

[J2] Deep learning STEM-EDX tomography of nanocrystals  
Yoseob Han\*, Jaeduck Jang\*, Eunju Cha\*, Junho Lee\*, Hyungjin Chung\* et al.  
Nature Machine Intelligence, 2021 (March Issue cover)

[J1] 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

[J0] 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

Reviewer (Conference)	ICLR 2024 NeurIPS 2022-2023, NeurIPS 2023 Datasets&Benchmarks, NeurIPSW Diffusion 2023 NeurIPSW ML4PS 2022-2023 CVPR 2023 ECCV 2022, ICCV 2023 MICCAI 2022-2023
Reviewer (Journal)	IEEE TMI ( <b>Distinguished reviewer</b> ) IEEE TPAMI IEEE TCI IEEE TSP IEEE TIP Medical Image Analysis <a href="#">See full list</a>
Invited talks & Lectures	<b>Advances in diffusion models and their applications to inverse problems</b> - Guest Lecture, Korea University 2023.11 <b>Adapting diffusion models for inverse problems</b> - 2023 NeurIPS Workshop on diffusion models 2023.12 (TBD) - Google Research 2023.10 <b>Generative (diffusion) models for medical imaging</b> - <a href="#">International Congress on Magnetic Resonance Imaging (ICMRI) 2023</a> 2023.11 - Michigan State University 2023.09 - Stanford MedAI: <a href="#">youtube</a> 2023.08 - MGH, School of Medicine, Harvard University 2023.08 - BRIC academic webinar: <a href="#">youtube</a> 2023.03 - 45 <sup>th</sup> meeting, The Korean Society of Abdominal Radiology, 2022 2022.06 <b>Diffusion models: foundations and applications in biomedical imaging</b> - IEEE International Symposium on Biomedical Imaging (ISBI) 2023 <a href="#">tutorial</a> 2023.05 <b>Diffusion models for inverse problems</b> - Inference & control group seminar, Donders Institute, Radboud Univ.: <a href="#">youtube</a> 2023.01 - LANL T-CNLS seminar, 2022 2022.08
Preprints	<b>[P2]</b> Steerable Conditional Diffusion for Out-of-Distribution Adaptation in Imaging Inverse Problems Riccardo Barbano*, Alexander Denker*, <a href="#">Hyungjin Chung*</a> , Tae Hoon Roh, Simon Arridge, Peter Maass, Bangti Jin, Jong Chul Ye <b>[P1]</b> Generative AI for Medical Imaging: extending the MONAI Framework Pinaya <i>et al.</i> ( <a href="#">Hyungjin Chung</a> : Contributing author) <b>[P0]</b> Fast Diffusion Sampler for Inverse Problems by Geometric Decomposition <a href="#">Hyungjin Chung</a> , Suhyeon Lee, Jong Chul Ye
Teaching experience	<b>Head TA, KAIST</b> Fall 2021 BiS 800: Machine Learning for Medical Image Analysis <b>TA, KAIST</b> 2019-2022 AI 618: Generative models and unsupervised learning MAS 480: Advanced Intelligence BiS 452: Biomedical Imaging BiS 301: Bioengineering Laboratory I
References	<b>Jong Chul Ye</b> 2019.03 - current

Ph.D. advisor (KAIST)

**Michael T. McCann**

Host (LANL)

**Mauricio Delbracio**

Host (Google)

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2022.06 - 2022.08

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2023.07 - current

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