

# Hyungjin Chung

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Research interests	Generative models, Diffusion models, Inverse problems	
Work Experience	<b>EverEx</b>	Seoul, Korea
	AI Research Advisor	2024.08 – Current
	<b>NVIDIA Research</b>	San Jose, USA (remote)
	Research Scientist Intern, AI4Science	2023.11 – 2024.01
	<b>Google Research</b>	Mountain View, USA
	Student Researcher, team LUMA (perception)	2023.07 – 2023.10
Education	<b>Los Alamos National Laboratory</b>	Los Alamos, USA
	Research intern, Applied math & Plasma physics (T-5)	2022.06 – 2022.08
	<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
Awards	B.S., Biomedical Engineering	2015.03 – 2019.02
	<b>Google Conference Scholarship</b> (\$3000)	2024.5
	<b>30<sup>th</sup> Samsung Humantech Gold Award</b> (\$20000)	2024.2
	- 1st prize in Signal Processing	
	<b>Bronze Prize, IPIU 2024</b>	2024.2
	<b>29<sup>th</sup> Samsung Humantech Gold Award</b> (\$10000)	2023.2
Professional Service	- 1st prize in Signal Processing	
	<b>2020-2023 BISPL Best Researcher Award</b> (\$4000×4)	2020-2023.12
	<b>Advisory board member</b>	Seoul, Korea
	<b>SNUH Rad-AICON: SNUH-Radiology AI Collaboration Network</b>	2021.05 – Present
Conf. publication	<b>[C10]</b> Deep Diffusion Image Prior for Efficient OOD Adaptation in 3D Inverse Problems	
	<a href="#">Hyungjin Chung</a> and Jong Chul Ye	
	ECCV 2024	
	<b>[C9]</b> Prompt-tuning Latent Diffusion Models for Inverse Problems	
	<a href="#">Hyungjin Chung</a> , Jong Chul Ye, Peyman Milanfar, Mauricio Delbracio	
	ICML 2024	
	<b>[C8]</b> Decomposed Diffusion Sampler for Accelerating Large-Scale Inverse Problems	
	<a href="#">Hyungjin Chung</a> , Suhyeon Lee, Jong Chul Ye	
	ICLR 2024	
	<b>[C7]</b> Direct Diffusion Bridge using Data Consistency for Inverse Problems	
	<a href="#">Hyungjin Chung</a> , Jeongsol Kim, Jong Chul Ye	
	NeurIPS 2023	
	<b>[C6]</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	

ICCV 2023

[C5] Score-based Diffusion Models for Bayesian Image Reconstruction

Michael T. Mccann, [Hyungjin Chung](#), Jong Chul Ye, Marc L. Klasky

ICIP 2023

[C4] Parallel Diffusion Models of Operator and Image for Blind Inverse Problems

[Hyungjin Chung](#)<sup>\*</sup>, Jeongsol Kim<sup>\*</sup>, Sehui Kim, Jong Chul Ye

CVPR 2023

[C3] Diffusion Posterior Sampling for General Noisy Inverse Problems

[Hyungjin Chung](#)<sup>\*</sup>, Jeongsol Kim<sup>\*</sup>, Michael T. Mccann, Marc L. Klasky, Jong Chul Ye

ICLR 2023 (Notable-top-25%)

[C2] Improving Diffusion Models for Inverse Problems using Manifold Constraints

[Hyungjin Chung](#)<sup>\*</sup>, Byeongsu Sim<sup>\*</sup>, Dohoon Ryu, Jong Chul Ye

NeurIPS 2022

[C1] Come-Closer-Diffuse-Faster: Accelerating Conditional Diffusion Models for Inverse Problems through Stochastic Contraction

[Hyungjin Chung](#), Byeongsu Sim, and Jong Chul Ye

CVPR 2022

## Journal publications

[J12] Fundus image enhancement through direct diffusion bridges

Sehui Kim<sup>\*</sup>, [Hyungjin Chung](#)<sup>\*</sup>, Se Hie Park, Eui-Sang Chung, Kayoung Yi, Jong Chul Ye

*IEEE JBHI*, 2024

[J11] MR Image Denoising and Super-Resolution Using Regularized Reverse Diffusion

[Hyungjin Chung](#), Eun Sun Lee, Jong Chul Ye

*IEEE TMI*, 2022

[J10] Low-dose sparse-view HAADF-STEM-EDX tomography of nanocrystals using unsupervised deep learning

Eunju Cha<sup>\*</sup>, [Hyungjin Chung](#)<sup>\*</sup>, Jaeduck Jang, Junho Lee, Eunha Lee, Jong Chul Ye

*ACS Nano*, 2022

[J9] Score-based diffusion models for accelerated MRI

[Hyungjin Chung](#) and Jong Chul Ye

*Medical Image Analysis*, 2021

[J8] Unsupervised Deep Learning Methods for Biological Image Reconstruction and Enhancement

Mehmet Akçakaya, Burhaneddin Yaman, [Hyungjin Chung](#), Jong Chul Ye

*IEEE SPM*, 2021

[J7] A Deep Learning Model for Diagnosing Gastric Mucosal Lesions Using Endoscopic Images: Development, Validation, and Method Comparison

Joon Yeul Nam<sup>\*</sup>, [Hyungjin Chung](#)<sup>\*</sup>, Kyu Sung Choi<sup>\*</sup>, Hyuk Lee<sup>\*</sup> et al.

*Gastrointestinal Endoscopy*, 2021

[J6] Feature Disentanglement in generating three-dimensional structure from two-dimensional slice with sliceGAN

[Hyungjin Chung](#), Jong Chul Ye

*Nature Machine Intelligence*, 2021

[J5] Missing Cone Artifacts Removal in ODT using Unsupervised Deep Learning in Projection Domain

[Hyungjin Chung](#)<sup>\*</sup>, Jaeyoung Huh<sup>\*</sup>, Geon Kim, Yong Keun Park, Jong Chul Ye

*IEEE Transactions on Computational Imaging*, 2021

[J4] Two-Stage Deep Learning for Accelerated 3D Time-of-Flight MRA without Matched Training Data

[Hyungjin Chung](#), Eunju Cha, Leonard Sunwoo, Jong Chul Ye

	<p><i>Medical Image Analysis</i>, 2021</p> <p><b>[J3]</b> Deep learning STEM-EDX tomography of nanocrystals Yoseob Han*, Jaeduck Jang*, Eunju Cha*, Junho Lee*, <a href="#">Hyungjin Chung*</a> et al. <i>Nature Machine Intelligence</i>, 2021 (March Issue cover)</p> <p><b>[J2]</b> Unpaired training of deep learning tMRA for flexible spatio-temporal resolution Eunju Cha, <a href="#">Hyungjin Chung</a>, Eung Yeop Kim, Jong Chul Ye <i>IEEE Transactions on Medical Imaging</i>, 2020</p> <p><b>[J1]</b> Unpaired deep learning for accelerated MRI using optimal transport driven cycleGAN Gyutaek Oh, Byeongsu Sim, <a href="#">Hyungjin Chung</a>, Leonard Sunwoo, Jong Chul Ye <i>IEEE Transactions on Computational Imaging</i>, 2020</p>
Workshop publication	<p><b>[W1]</b> Progressive Deblurring of Diffusion Models for Coarse-to-Fine Image Synthesis Sangyun Lee, <a href="#">Hyungjin Chung</a>, Jaehyeon Kim, Jong Chul Ye <i>NeurIPS Workshop on score-based methods (SBM)</i>, 2022</p>
Books	<p><b>[B1]</b> Deep Learning for Biomedical Image Reconstruction Chapter 12: Image Synthesis in Multi-Contrast MRI with Generative Adversarial Networks Tolga Çukur, Mahmut Yurt, Salman Ul Hassan Dar, <a href="#">Hyungjin Chung</a>, Jong Chul Ye</p>
Reviewer (Conference)	<p>ICLR 2024-2025 NeurIPS 2022-2024 NeurIPS Datasets&amp;Benchmarks 2023-2024 CVPR 2023-2024 ECCV 2022, 2024 ICCV 2023 MICCAI 2022-2023</p>
Reviewer (Journal)	<p>NEJM AI Nature Communications Medical Image Analysis IEEE TMI (<i>Gold Distinguished reviewer 2024, Bronze Distinguished reviewer 2023</i>) IEEE TPAMI, TCI, TSP, TIP, SPS <a href="#">See full list</a></p>
Invited talks & Lectures	<p><b>Texts in inverse problem solving using diffusion models</b></p> <ul style="list-style-type: none"> <li>- <i>University of Michigan</i> 2024.10</li> </ul> <p><b>Tutorial on Denoising Diffusion Model: Fundamentals &amp; Applications</b></p> <ul style="list-style-type: none"> <li>- <i>IEIE: Winter School on Biomedical Signal Processing</i> 2024.02</li> </ul> <p><b>Adapting diffusion models for inverse problems</b></p> <ul style="list-style-type: none"> <li>- <i>UCLA, Caltech: Grundfest Memorial Lecture Series in Graphics and Imaging</i> 2024.02</li> <li>- <i>2023 NeurIPS Workshop on diffusion models</i> 2023.12</li> <li>- <i>Google Research</i> 2023.10</li> </ul> <p><b>Advances in diffusion models and their applications to inverse problems</b></p> <ul style="list-style-type: none"> <li>- <i>Guest Lecture, Korea University</i> 2023.11</li> </ul> <p><b>Generative (diffusion) models for medical imaging</b></p> <ul style="list-style-type: none"> <li>- <i>International Congress on Magnetic Resonance Imaging (ICMRI) 2023</i> 2023.11</li> <li>- <i>Michigan State University</i> 2023.09</li> <li>- <i>Stanford MedAI</i> 2023.08</li> <li>- <i>MGH, School of Medicine, Harvard University</i> 2023.08</li> <li>- <i>BRIC academic webinar</i> 2023.03</li> </ul>

	- 45 <sup>th</sup> meeting, The Korean Society of Abdominal Radiology, 2022	2022.06
	<b>Diffusion models: foundations and applications in biomedical imaging</b>	
	- <i>IEEE International Symposium on Biomedical Imaging (ISBI) 2023</i>	2023.05
	<b>Diffusion models for inverse problems</b>	
	- IPA seminar, Korea University	2024.09
	- Krafton AI	2024.09
	- DRGem	2024.08
	- LG AI Research	2024.08
	- Twelve Labs	2024.06
	- <i>AI SEOUL 2024</i>	2024.02
	- <i>Inference &amp; control group seminar, Donders Institute, Radboud Univ.</i>	2023.01
	- LANL T-CNLS seminar, 2022	2022.08
Preprints	<b>[P6]</b> A survey on diffusion models for inverse problems Giannis Daras, <a href="#">Hyungjin Chung</a> , Chieh-Hsin Lai, Yuki Mitsufuji, Jong Chul Ye, Peyman Milanfar, Alexandros G Dimakis, Mauricio Delbracio	
	<b>[P5]</b> Amortized Posterior Sampling with Diffusion Prior Distillation Abbas Mammadov*, <a href="#">Hyungjin Chung*</a> , Jong Chul Ye	
	<b>[P4]</b> CFG++: Manifold-constrained Classifier Free Guidance for Diffusion Models <a href="#">Hyungjin Chung*</a> , Jeongsol Kim*, Geon-Yeong Park*, Hyelin Nam*, Jong Chul Ye	
	<b>[P3]</b> Regularization by texts for latent diffusion inverse solvers Jeongsol Kim*, Geon-Yeong Park*, <a href="#">Hyungjin Chung</a> , Jong Chul Ye	
	<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)	
Patent	<b>US patent application</b> Score-based Diffusion Model for Accelerated MRI and Apparatus thereof	2023
	<b>Korea patent publication</b> Tomography image processing method using neural network based on unsupervised learning to remove missing cone artifacts and apparatus therefor	2023
	Two-Stage unsupervised learning method for 3D Time-of-flight MRA reconstruction and the apparatus thereof	2023
	<b>Korea patent application</b> Accelerating method of conditional diffusion models for inverse problems using stochastic contraction and the apparatus thereof	2021
	Extreme condition reconstruction method HAADF-STEM-EDX tomography using unsupervised deep learning and the apparatus thereof	2021
Teaching experience	<b>Head TA, KAIST</b> AI 618: Generative models and unsupervised learning	2024-1
	BiS 800: Machine Learning for Medical Image Analysis	2021-2
	<b>TA, KAIST</b> AI 618: Generative models and unsupervised learning	2022-2
	MAS 480: Advanced Intelligence	2021-1
	BiS 452: Biomedical Imaging	2020-2
	BiS 301: Bioengineering Laboratory I	2019, 2020-1

## References

### **Jong Chul Ye**

Ph.D. advisor (KAIST)

2019.03 - current

[jong.ye@kaist.ac.kr](mailto:jong.ye@kaist.ac.kr)

### **Marc L. Klasky**

2022.06 - 2022.08

Host (LANL)

[mklasky@lanl.gov](mailto:mklasky@lanl.gov)

### **Michael T. McCann**

2022.06 - 2022.08

Host (LANL)

[mccann@lanl.gov](mailto:mccann@lanl.gov)

### **Mauricio Delbracio**

2023.07 - 2023.11

Host (Google)

[mdelbra@google.com](mailto:mdelbra@google.com)