Hyungjin Chung

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Research interests

Generative models, Diffusion models, Inverse problems, Computational Imaging

Work Experience

Google Research 2023.07 – Present
Student Researcher, team LUMA (perception)

Alphasignal 2023.03 – Present
Technical writer

Los Alamos National Laboratory 2022.06 – 2022.08
Research intern, Applied math & Plasma physics (T-5)

Awards

29th Samsung Humantech Gold Award (1st in signal Processing) 2023.2

2020-2022 BISPL Best Researcher Award 2020-2022.12

Conf. publication

[C6] Direct Diffusion Bridge using Data Consistency for Inverse Problems
Hyungjin Chung, Jeongsol Kim, Jong Chul Ye
NeurIPS 2023

[C5] Improving 3D Imaging with Pre-Trained Perpendicular 2D Diffusion Models
Suhyeon Lee*, Hyungjin Chung*, Minyoung Park, Jonghyuk Park, Wi-Sun Ryu, Jong Chul Ye
ICCV 2023

[C4] Score-based Diffusion Models for Bayesian Image Reconstruction
Michael T. Mccann, Hyungjin Chung, Jong Chul Ye, Marc L. Klasky
ICIP 2023

[C3] Parallel Diffusion Models of Operator and Image for Blind Inverse Problems
Hyungjin Chung*, Jeongsol Kim*, Sehui Kim, Jong Chul Ye
CVPR 2023

[C2] Diffusion Posterior Sampling for General Noisy Inverse Problems
Hyungjin Chung*, Jeongsol Kim*, Michael T. Mccann, Marc L. Klasky, Jong Chul Ye
ICLR 2023 (Notable-top-25%)

[C1] Improving Diffusion Models for Inverse Problems using Manifold Constraints
Hyungjin Chung*, Byeongsu Sim*, Dohoon Ryu, Jong Chul Ye
NeurIPS 2022

[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

Invited talks & tutorials

[T9] Adapting & Expanding diffusion models for inverse problems 2023.12 (TBD)
2023 NeurIPS Workshop on diffusion models

[T8] Generative models for MRI reconstruction and enhancement 2023.11
International Congress on Magnetic Resonance Imaging (ICMRI) 2023

[T7] Diffusion models for medical imaging 2023.09
SLIM group seminar, Michigan State University

[T6] Generative diffusion model for medical imaging 2023.08
Stanford MedAI: youtube

[T5] Medical imaging in the era of generative AI 2023.08
MGH, School of Medicine, Harvard University

[T4] Diffusion models: foundations and applications in biomedical imaging 2023.05
IEEE International Symposium on Biomedical Imaging (ISBI) 2023 tutorial

[T3] Solving Biomedical imaging through diffusion models 2023.03
BRIC academic webinar: youtube

[T2] Diffusion models for inverse problems 2023.01
Inference & control group seminar, Donders Institute, Radboud Univ.: youtube

[T1] Diffusion models for inverse problems in imaging 2022.08
LANL T-CNLS seminar, 2022

[T0] Deep learning-based MR reconstruction 2022.06
45th meeting, The Korean Society of Abdominal Radiology, 2022

Professional Service

Research Advisor 2023.07 – Present
Team Learners

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

Reviewer (Conference)

ICLR 2024, NeurIPS 2022-2023, NeurIPS 2023 Datasets&Benchmarks, CVPR 2023, ICCV/ECCV 2022-2023, MICCAI 2023

Reviewer (Journal)

IEEE TMI (**Distinguised reviewer**), TPAMI, TCI, TIP, MeDIA

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

Preprints

[P2] Steerable Conditional Diffusion for Out-of-Distribution Adaptation in Imaging Inverse Problems
Riccardo Barbano*, Alexander Denker*, Hyungjin Chung*, Tae Hoon Roh, Simon Arrdige, Peter Maass, Bangti Jin, Jong Chul Ye

[P1] Generative AI for Medical Imaging: extending the MONAI Framework
Pinaya *et al.* (Hyungjin Chung: Contributing author)

[P0] Fast Diffusion Sampler for Inverse Problems by Geometric Decomposition
Hyungjin Chung, Suhyeon Lee, Jong Chul Ye

Education

KAIST — Daejeon, Korea
Ph.D., Bio & Brain Engineering — 2019.03 – 2025.02(expected)
Advisor: Jong Chul Ye

Korea University — Seoul, Korea
B.S., Biomedical Engineering — 2015.03 – 2019.02

Teaching experience

Head TA, KAIST — Fall 2021
BiS 800: Machine Learning for Medical Image Analysis

TA, KAIST — 2019-2022
AI 618: Generative models and unsupervised learning
MAS 480: Advanced Intelligence
BiS 452: Biomedical Imaging
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
Host (LANL) — mccann@lanl.gov

Mauricio Delbracio — 2023.07 - current
Host (Google) — mdelbra@google.com