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Yoonseok Choi

Seoul, South Korea

yoonseokchoi@yonsei.ac.kr | yoonseok-choi

Biography

I am a third-year Ph.D. student at Yonsei University, advised by **Prof. Dong-Hyun Kim** in the **Medical Imaging AI Lab (MILAB)**. In 2025, I am also conducting research as a **visiting student** at the **Vision and Learning Lab (VLLab), UC Merced**, under the supervision of **Prof. Ming-Hsuan Yang**, expanding my expertise in computer vision and generative modeling.

My doctoral research focuses on medical image analysis and computer vision, with a particular emphasis on developing deep learning methods to address **clinical unmet needs** such as the **missing modality issue** in MRI. My broader research interests include **segmentation, super-resolution, motion artifact correction, image generation, disentangled representation learning, and MRI analysis**. I am motivated by challenges that bridge fundamental deep learning techniques with real-world clinical applications, aiming to create robust and generalizable AI solutions for healthcare.

Education

Ph.D. in Electrical and Electronic Engineering — Seoul, South Korea
Yonsei University — *Mar 2023 – Present*
Advisor: Dong-Hyun Kim

M.S. in Electrical and Electronic Engineering — Seoul, South Korea
Yonsei University — *Mar 2021 – Fev 2023*
Advisor: Dong-Hyun Kim

B.S. in Biomedical Engineering — Wonju, South Korea
Yonsei University — *Mar 2015 – Feb 2021*
Advisor: Young-Ro Yoon

Selected Publications (* Equal Contribution)

Conference Paper

1. TESLA: Test-time Reference-free Through-plane Super-resolution for Multi-contrast Brain MRI

Yoonseok Choi, Sunyoung Jung, Mohammed A. Al-masni, Ming-Hsuan Yang, and Dong-Hyun Kim
MICCAI 2025*, *Oral presentation, Top 2.2%

2. Deformation-Aware Segmentation Network Robust to Motion Artifacts for Brain Tissue Segmentation using Disentanglement Learning

Sunyoung Jung, **Yoonseok Choi**, Mohammed A. Al-masni, Minyoung Jung, and Dong-Hyun Kim
MICCAI 2024

3. Brain Tissue Segmentation Robust to motion artifacts using Deformation-Aware Network

Sunyoung Jung, **Yoonseok Choi**, Mohammed A. Al-masni, and Dong-Hyun Kim
ISMRM 2024*, *Oral presentation

4. Two-Stage Deep Learning with Multi-Pathway Network for Brain Tumor Segmentation and Malignancy Identification From MR Images

Yoonseok Choi, Mohammed A. Al-masni, Hyeok Park, Jun-ho Kim, and Dong-Hyun Kim
ISMRM 2023*, *Oral presentation

5. 3D CMM-Net with Deeper Encoder for Semantic Segmentation of Brain Tumors in BraTS2021 Challenge

Yoonseok Choi, Mohammed A. Al-masni, and Dong-Hyun Kim
MICCAI 2021 Brain Lesion Workshop

Journal Paper

1. Test-time Reference-free Through-plane Super-resolution Network for Multi-contrast Brain MRI via Disentangled Representations

Yoonseok Choi, Sunyoung Jung, Gayoon Choi, Mohammed A. Al-masni, Kyu-Jin Jung, Wei-Ting Chen, Ming-Hsuan Yang, and Dong-Hyun Kim
Medical Image Analysis (MedIA), submitted, 2025, impact factor 11.8

2. A Single Stage Knowledge Distillation Network for Brain Tumor Segmentation on Limited MR Image Modalities

Yoonseok Choi, Mohammed A. Al-masni, Kyu-Jin Jung, Roh-Eul Yoo, Seong-Yeong Lee, and Dong-Hyun Kim
Computer Methods and Programs in Biomedicine (CMPB), 2023, impact factor 6.1

Patents

1. Integrated Software Platform to Visualize Brain Tumor Segmentation Masks from MR Image

Yoonseok Choi, Hyeok Park, and Dong-Hyun Kim
Registration Number: C-2022-032255 (Software Registration), Registration Date: Aug 17, 2022

2. Apparatus and Method for Segmenting Brain Tumors from MR Images

Yoonseok Choi and Dong-Hyun Kim
Application Number: 10-2022-0136260, Application Date: Oct 21, 2022

Experience

Vision and Learning Lab (VLLab) - Visiting Student — Merced, USA
University of California at Merced — Feb 2025 – Present

- Research on super-resolution and diffusion models in medical imaging

Medical Imaging Artificial Intelligence Lab (MILab) - Intern Seoul, South Korea
Yonsei University Jul 2020 – Feb 2021

- Research on parallel imaging and semantic segmentation in Brain MRI

Biomedical Signal Processing Lab - Intern Wonju, South Korea
Yonsei University Mar 2019 – Feb 2021

- Development of a skin condition measurement device using TEWL (TransEpidermal Water Loss)

Awards and Honors

1. Cognitive and Biological Factors Related to the Development of Question-Asking Abilities in School-Aged Children, Junior Convergence Research Group (1st place, 1,500,000 won), 2025

Hyebin Sung, Seoran Kim, Yuju Shin, Dongwook Kim, Jae-Yoon Kim, Jun-Ho Kim, Soohyoung Lee, **Yoonseok Choi**, and Eun-Gyu Ha

2. BK21 FOUR (Brain Korea 21 Four) Project; Support Program for Outstanding Graduate Students' International Joint Training 1 year from the commencement of training (12months, 26,000,000 won), 2024

Yoonseok Choi

3. Structural brain correlates of foreign language proficiency and experiences, Junior Convergence Research Group (3rd place, 500,000 won), 2023

XIAOQIAO WANG, Seoran Kim, Jae-Yoon Kim, Jun-Ho Kim, **Yoonseok Choi**, and Eun-Gyu Ha

4. DSU-Net2D: Deep Supervision U-Net2D, Medical Image Processing Contest with Rayence and Yonsei University (2nd place, 2,000,000 won), 2022

Yoonseok Choi and Sewook Kim

Academic Activities

Conference Reviewer

*MEDICAL IMAGE COMPUTING AND COMPUTER ASSISTED INTERVENTION (**MICCAI**)* *2025*
*International Conference on Computer Vision (**ICCV**)* *2025*