

Joonwoo Kwon

Physics-Informed Deep Learning,
Generative Modeling, Computer Vision

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Education	08/2025 – East Lansing, MI	Michigan State University (MSU) Ph.D. in Computer Science and Engineering (Advisor: Dr. Zijun Cui)
	03/2021 – 02/2023 Seoul, South Korea	Seoul National University (SNU) M.S. in Applied Bioengineering
	03/2015 – 02/2021 Suwon, South Korea	SungKyunKwan University (SKKU) B.S. in Electronic and Electrical Engineering

Research Experience	02/2023 – 12/2024 Seoul, South Korea	SNU Connectome Lab (Advisor: Dr. Jiook Cha) <i>Research Associate Neuroscience & Generative Modeling</i> <ul style="list-style-type: none">Developed a new neural style transfer method (C1) for aesthetic-aware stylization.Designed an image-to-image translation model (P1) for cross-modal MRI synthesis.Proposed a novel generation task, dataset, and a multimodal framework (C2) for reconstructing video with music contextualized by human affect from brain signals.
	02/2023 – 12/2024 Upton, NY (Remote)	Brookhaven National Lab (Advisor: Dr. Shinjae Yoo, Dr. Yuewei Lin) <i>Research Associate Computer Vision & Multimodal Learning</i> <ul style="list-style-type: none">Developed a training-free approach for music style transfer (P2) by directly manipulating the self-attention features of pre-trained diffusion models.Designed viscosity-aware style optimization and brushstroke parameterization to emulate the physical and textural properties of oil painting and watercolor.Proposed a brain-to-text generation model and showed its versatility (e.g., composable brain decoding), inspired by how the brain perceives the visual world.
	03/2022 – 06/2022 Seoul, South Korea	Samsung Advanced Institute of Technology (SAIT) (Research Capstone) <i>Student Researcher Image-to-image translation, Semiconductor, and 3D Depth</i> <ul style="list-style-type: none">Led research on an image-to-image translation model utilizing U-NET and PatchGAN to synthesize 3D depth maps from SEM imaging.

Professional Experience	01/2025 – 05/2025 YongIn, South Korea	Hanwha Systems Co., Ltd. (Defense) Institute of Advanced Technologies (Space) <i>Research Scientist (Full-time) Military Satellite Imaging (SAR)</i> <ul style="list-style-type: none">Developed image registration algorithms for SAR (Synthetic Aperture Radar) analysis.
	10/2024 – 12/2024 Seoul, South Korea	Planningo Inc. <i>Research Engineer Commercial Photography, Image Compositing</i> <ul style="list-style-type: none">Developed an image harmonization framework that resolves inconsistencies in lighting, textures, and color for commercial photography compositing.

Publications († denotes corresponding author)	[P2]. A Training-Free Approach for Music Style Transfer with Latent Diffusion Models Kim, S.*, Kwon, J.* , Wang, H.*, Yoo, S.†, Lin, Y.†, & Cha, J.† Under Review, 2025.	
	[P1]. Macro2Micro: Cross-modal Magnetic Resonance Imaging Synthesis Leveraging Multi-scale Brain Structures Kim, S.*, Kwon, J.* , Kwon, J.*, Bae S., Yoo, S.†, Lin, Y.†, & Cha, J.† Under Review, 2025.	
	[C2]. Revisiting Your Memory: Reconstruction of Affect-Contextualized Memory via EEG-guided Audiovisual Generation Kwon, J.* , Wang, H.*, Lee, J.*, Kim, S.*, Yoo, S., Lin, Y.,† & Cha, J.† ACM MM CogMAEC '25 (Oral)	
	[C1]. AesFA: An Aesthetic Feature-Aware Arbitrary Neural Style Transfer Kwon, J.* , Kim, S.*, Yoo, S.†, Lin, Y.†, & Cha, J.† AAAI 2024. Acceptance Rate: 23.75% (2342/12100).	

Skills	Communications	English (Fluent; TOEFL 110; R30 L29 S24 W27), Korean (Native)
	Programming	Python, PyTorch, TensorFlow, MATLAB, C, R
	Others	Hardware Languages Verilog (intermediate), VHDL (intermediate)