

Joonwoo Kwon

Physics-Informed Deep Learning,
Generative Modeling, Computer Vision

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

Research Experience	02/2023 – 12/2024	SNU Connectome Lab (Advisor: Dr. Jiook Cha)
	Seoul, South Korea	Research Associate Neuroscience & Generative Modeling - 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	Brookhaven National Lab (Advisor: Dr. Shinjae Yoo, Dr. Yuewei Lin)
	Upton, NY (Remote)	Research Associate Computer Vision & Multimodal Learning - 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	Samsung Advanced Institute of Technology (SAIT) (Research Capstone)
	Seoul, South Korea	Student Researcher Image-to-image translation, Semiconductor, and 3D Depth 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	Hanwha Systems Co., Ltd. (Defense) Institute of Advanced Technologies (Space)
	YongIn, South Korea	Research Scientist (Full-time) Military Satellite Imaging (SAR) Developed image registration algorithms for SAR (Synthetic Aperture Radar) analysis.
	10/2024 – 12/2024	Planningo Inc.
	Seoul, South Korea	Research Engineer Commercial Photography, Image Compositing 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.†	
	AAAI 2025 Workshop on Artificial Intelligence for Music (AI4Music)	
	[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)