Joonwoo Kwon

Website

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Summary of Qualifications

- **Expertise in developing algorithms for generative vision and language modeling**, creating digital images and media content across various application domains such as art, medical, advertising, and the semiconductor industry.
- Four publications including being selected for the 38th AAAI conference on artificial intelligence (2024).
- Six research projects collaborating with global institutions and corporate partners.

Research Interests: Computer Vision, Generative Models, and Human-AI Collaboration

Education

2021 – 2023	**Seoul National University (SNU)**, Seoul, Korea
	M.S. in Applied Bioengineering | GPA: 3.88/4.0 (97.0%)
	Thesis: Improving the Stylization Quality of Neural Style Transfer using Octave Convolution
2015 – 2021	**SungKyunKwan University (SKKU)**, Seoul, Korea
	B.S. in Electronic and Electrical Engineering | GPA: 3.75/4.5 (92.5%)
	Senior Capstone: An Appreciation Aid Tool for the Visually Impaired via Synesthetic Perception

Publications

CONFERENCE PROCEEDINGS

c1   **Kwon, J.*,** Kim, S.*, Yoo, S., Lin, Y., & Cha, J. (2024).
AesFA: An Aesthetic Feature-Aware Arbitrary Neural Style Transfer
AAAI 2024. 10 pages. 23.75% acceptance rate (2342/12100).

PREPRINTS & PUBLICATIONS IN PROGRESS

p3   Kim, S.*, **Kwon, J.*,** Park, M.*, Seo, J., Kim, S., Yoo, S., Lin, Y., & Cha, J. (2024).
Visual Attention Guidance Enables A Composable Brain-to-Image Decoding
Preprint.

p2   **Kwon, J.*,** Kim, S.*, Lee, S.*, Yoo, S., Lin, Y., & Cha, J. (2024).
AesPHA: An Aesthetic Physics-Aware Neural Style Transfer
Preprint.

p1   Kim, S.*, **<u>Kwon, J.*</u>**, Kwon, J., Bae, S., Yoo, S., Lin, Y., & Cha, J. (2024).
Macro2Micro: A Rapid and Precise Cross-modal Magnetic Resonance Imaging Synthesis Using Multi-scale Structural Brain Similarity
Preprint.

* denotes equal contributions

Experience

10/2024 – present	**Planningo**, Seoul, Korea AI Researcher (AI research partnership @ Seoul AI Hub)
02/2023 – present -	**Connectome Lab (SNU)**, Seoul, Korea Researcher (Advisor: Prof. Jiook Cha)
06/2022 – present	**U.S. DOE National Energy Research Scientific Computing Center Exa-scale Science Application Program (NESAP)**, Remote Researcher (Advisor: Prof. Shinjae Yoo, Prof. Yuewei Lin)
01/2022 – 03/2022	**Graduate School of Convergence Science and Technology (SNU)**, Suwon, Korea Research Intern (w/ Prof. Jeongmin Kim)
06/2021 – 09/2021 -	**IRIS Lab (SKKU)**, Suwon, Korea Researcher Intern (Advisor: Prof. Jonghwan Ko)
12/2019 – 02/2020	**ITECH Industrial Systems**, Gwangmeong, Korea Software Engineer Intern
09/2018 – 12/2018	**SK Telecom**, Suwon, Korea Software Engineer Intern
08/2018	**UN Office for Sustainable Development**, Tongyeong, Korea Intern

Projects

10/2024 – present	**An Image Harmonization Model for Visual Coherence in Commercial AI Photography,** Planningo
09/2023 – present	**Affect-Contextualized Perception Decoding with Cross-Species multiscale Neuroscience Foundation Model,** SNU Connectome Lab
09/2024 – 10/2024	**AI & Art Hackathon: Towards the Most Personalized Artworks**
03/2022 – 06/2022	**Samsung Advanced Institute of Technology Research Capstone**
09/2020 – 12/2020	**An Appreciation Aid Tool for the Visually Impaired via Synesthetic Perception**
09/2020 – 12/2020	**AI & Art: Generation of New Artworks with Style Transfer**
11/2019	**AI Novel Writing Competition**
11/2019	**Simple Classification of Malignant and Benign Skin Cancers using CNN**

Honors and Awards

2024	**The Grand Prize, AI & Art Hackathon (**$1,000 USD**),** AI Art Research Center, SNU
	• Title: "The Recollection of Your Most Cherished Experiences utilizing AI and Neural Signals"
2020	**Academic Excellence Scholarship for Outstanding Research** (25% tuition), SKKU
	• A Study on Memory Compression Techniques based on Data Patterns using Machine Learning
2020	**Corporate Partner Scholarship** (75% tuition), SKKU, ITECH Industrial Systems
2018	**The 9th Engineering Competition for Local Impact** (2nd Place, $455 USD), SKKU
2018	**Korean Patent** (Applied; Public Telephone Booth for Sightseeing)

Invited Talks, Exhibition and Teaching

10/2024	**ART DIFFUSION**, Tech to Art Platform (TAP) International Conference Prequel, Seoul National University Museum of Art, Seoul, Korea
09/2024	**Invited Talks: Attention Guidance Enables A Composable Brain-to-Image Decoding**
	• Annual Meetings on Brain Decoding, Seoul National University, Seoul, Korea
08/2018 – 12/2018	**Exchange Student Mentoring**, SKKU, Suwon, Korea (Electronic Circuits I; Introduction to Automatic Control)

Skills

Generative Modeling	Vision-Language, Diffusion model, Style Transfer, Image-to-Image Translation
Computer Vision	Classification, Object Detection, Segmentation, Linux, Pytorch, Tensorflow
AI for Science	Implicit Neural Representation, Fluid Dynamics Simulation (Intermediate)
Programming Languages	Python, MATLAB, C (intermediate), Latex, Arduino, R
Hardware Languages	Verilog (intermediate), VHDL (intermediate)
Fluent in **English** and Native in **Korean**	**TOEFL iBT 110** (R:30, L29, S24, W27)

References

Dr. Jiook Cha	Assoc. Professor, Department of Psychology, Seoul National University, Seoul, Korea Research Advisor	email: connectome@snu.ac.kr
Dr. Shinjae Yoo	Deputy Chair, Computational Science Initiative, Brookhaven National Laboratory, Upton, NY Research Advisor	email: sjyoo@bnl.gov
Dr. Yuewei Lin	Senior Computational Scientist & Foundation Model Group Lead, Computational Science Initiative, Brookhaven National Laboratory, Upton, NY Research Advisor	Email: ywlin@bnl.gov