

Patrick Kwon

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RESEARCH INTERESTS

My main research goal is to empower image generative models to better capture the workings of the real world, which will help pave way to solving various computer vision problems. My prior research areas include generative models, 3D human digitalization, talking head video generation / detection, and VR/AR programming.

EDUCATION

Master of Science Data Science Columbia University (GPA : 3.9/4.0)	Aug 2018 – Dec 2019 New York, NY
Bachelor of Arts Computer Science, Statistics University of Virginia (GPA : 3.8/4.0) (2 year early graduation)	Aug 2015 – May 2017 Charlottesville, VA

WORK EXPERIENCE

Deep Learning Researcher Naver Webtoon AI	Sep 2021 - Current Pangyo, ROK
<ul style="list-style-type: none">• Researched and designed deep learning solutions focused on image / 3D generation and editing	
Deep Learning Researcher Deepbrain AI	Jan 2020 - Sep 2021 Seoul, ROK
<ul style="list-style-type: none">• Researched and designed deep learning solutions for face generation and speech synthesis	
Research Assistant Columbia University CGUI Lab	Sep 2019 – Dec 2019 New York, NY
<ul style="list-style-type: none">• Developed Unity (C#) based Augmented Reality projects with Professor Steven K. Feiner.	
Data Scientist Emadri	June 2019 – Dec 2019 New York, NY
<ul style="list-style-type: none">• Designed recommendation systems for recommending packing list items for travelers.	
Data Analyst Krafton	June 2017 – Jul 2018 Pangyo, ROK
<ul style="list-style-type: none">• Provided 20+ data analysis papers on TERA, Krafton's leading MMORPG Title.	

PROJECTS AND RESEARCH

AI Studio : An easy-to-use generative AI framework Python, C# Naver Webtoon AI	June 2023
<ul style="list-style-type: none">• Created an interactive, user-friendly system of creating images based on generative AI models.	
Augmented-Reality-Assisted Intraoral Scanning (ARIOS) C# Columbia University	June 2023
<ul style="list-style-type: none">• Participated in a proof-of-concept study of implementing Augmented Reality towards intraoral scanning to further improve efficiency of scanning procedures.• Research abstract was accepted as an oral communication for EAO-DGI Joint Meeting 2023.	
Chupa : Diffusion-based 3D Human Digitalization Python, C# Naver Webtoon AI & Seoul National University	Feb 2023
<ul style="list-style-type: none">• Collaborated with SNU Visual Computing Lab in creating 3D clothed human models via diffusion probabilistic models.• Research paper was accepted as an oral paper to ICCV 2023.	

- LPMM : Facial landmark based Talking-head model | Python** Aug 2022
Naver Webtoon AI
- Proposed a novel method of creating photorealistic talking head videos with enhanced pose controllability.
 - Research paper was accepted to CVPR 2023 Workshop (AI4CC)
- StyleGAN3-Inversion for cartoon images | Python** Feb 2022
Naver Webtoon AI
- Introduced deep-learning based image reconstruction and editing methods towards translating photos into cartoon style illustrations, to aid artists and creators.
 - Research paper was accepted to CVPR 2023.
- KoDF: A Large-scale Korean DeepFake Detection Dataset | Python** Oct 2020
Deepbrain AI
- Large scale original/synthesized (deepfake) facial video dataset focused on asian subjects, along with a deepfake detection model trained on the dataset.
 - Research paper was accepted to ICCV 2021.
- Augmented Reality for Dental Implant Applications | C#** Nov 2019
Columbia University
- Augmented Reality program based on EPSON's Moverio smart glasses, aimed to aid dental students during implant practices.
- Pally : Augmented Reality for Social Transition | C#** June 2019
Verizon 5G Edtech Challenge
- Project on improving social skills for autistic children using Microsoft Hololens and 5G Network.

PUBLICATIONS

- B. Kim*, P. Kwon*, K. Lee, M. Lee, S. Han, D. Kim, and H. Joo. Chupa: Carving 3d clothed humans from skinned shape priors using 2d diffusion probabilistic models. *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*, May 2023
- K. Lee*, P. Kwon*, M. Lee, N. Ahn, and J. Lee. LPMM: Intuitive pose control for neural talking-head model via landmark-parameter morphable model. *arXiv preprint arXiv:2305.10456*, May 2023. doi: 10.48550/arXiv.2305.11870
- N. Ahn, P. Kwon, J. Back, K. Hong, and S. Kim. Interactive cartoonization with controllable perceptual factors. *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, December 2022. doi: 10.1109/CVPR52729.2023.01614
- P. Kwon, J. You, G. Nam, S. Park, and G. Chae. Kodf: A large-scale korean deepfake detection dataset. *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*, pages 10744–10753, October 2021. doi: 10.1109/ICCV48922.2021.01057

* indicates equal contribution

HONORS AND AWARDS

- Verizon 5G Edtech Challenge Winning Project** May 2019
- UVA Order of the Orange Stole** May 2017
Recognition for early graduation at University of Virginia
- Dean's List** August 2015 – May 2017
Recognition for academic excellence at University of Virginia

SKILLS

Languages: Korean, English

Programming: Python (PyTorch, Tensorflow), MATLAB, C++, C#, Java, SQL, R Studio, AWS, Azure