Susung Hong

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Research Interest

My research interests lie in the foundations of generative AI, including diffusion models and guidance, attention, and model orchestration, and in its applications to producing immersive video/3D content.

Education

2024–   **University of Washington**
Ph.D. in Computer Science & Engineering
Advisors: Steve Seitz, Brian Curless, Ira Kemelmacher-Shlizerman

2018–2024   **Korea University**
B.S. in Computer Science & Engineering
GPA: 3.95/4.0 | Military Service: 2020–2021

Publications

2025   **Spatiotemporal Skip Guidance for Enhanced Video Diffusion Sampling**
Junha Hyung*, Kinam Kim*, **Susung Hong**, Min-Jung Kim, and Jaegul Choo
*IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2025

2025   **Perturb-and-Revise: Flexible 3D Editing with Generative Trajectories**
Susung Hong, Johanna Karras, Ricardo Martin-Brualla, and Ira Kemelmacher-Shlizerman
*IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2025

2024   **Smoothed Energy Guidance: Guiding Diffusion Models with Reduced Energy Curvature of Attention**
Susung Hong
*Advances in Neural Information Processing Systems (**NeurIPS**)*, 2024

2024   **Effective Rank Analysis and Regularization for Enhanced 3D Gaussian Splatting**
Junha Hyung, **Susung Hong**, Sungwon Hwang, Jaeseong Lee, Jaegul Choo, and Jin-Hwa Kim
*Advances in Neural Information Processing Systems (**NeurIPS**)*, 2024

2024   **Retrieval-augmented Score Distillation for Text-to-3D Generation**
Junyoung Seo*, **Susung Hong***, Wooseok Jang*, Min-Seop Kwak, Hyeonsu Kim, Doyup Lee, and Seungryong Kim
*International Conference on Machine Learning (**ICML**)*, 2024

2024   **Depth-Aware Guidance with Self-Estimated Depth Representations of Diffusion Models**
Gyeongnyeon Kim*, Wooseok Jang*, Gyuseong Lee*, **Susung Hong**, Junyoung Seo, and Seungryong Kim
*Pattern Recognition (**PR**)*, 2024

2023   **Large Language Models are Frame-level Directors for Zero-shot Text-to-Video Generation**
Susung Hong, Junyoung Seo, Heeseong Shin, Sunghwan Hong, and Seungryong Kim
Short Version: First Workshop on Controllable Video Generation at ICML, 2023

2023   **Debiasing Scores and Prompts of 2D Diffusion for View-consistent Text-to-3D Generation**
Susung Hong*, Donghoon Ahn*, and Seungryong Kim
*Advances in Neural Information Processing Systems (**NeurIPS**)*, 2023

2023   **Improving Sample Quality of Diffusion Models Using Self-Attention Guidance**
Susung Hong, Gyuseong Lee, Wooseok Jang, and Seungryong Kim
*IEEE/CVF International Conference on Computer Vision (**ICCV**)*, 2023

2022   **Neural Matching Fields: Implicit Representation of Matching Fields for Visual Correspondence**
Sunghwan Hong, Jisu Nam, Seokju Cho, **Susung Hong**, Sangryul Jeon, Dongbo Min, and Seungryong Kim
*Advances in Neural Information Processing Systems (**NeurIPS**)*, 2022

Preprints

2025   **MusicInfuser: Making Video Diffusion Listen and Dance**
Susung Hong, Ira Kemelmacher-Shlizerman, Brian Curless, and Steven M. Seitz
Under Review, 2025

2025   **Fine-Grained Perturbation Guidance via Attention Head Selection**
Donghoon Ahn*, Jiwon Kang*, Sanghyun Lee, Minjae Kim, Jaewon Min, Wooseok Jang, Saungwu Lee, Sayak Paul, **Susung Hong**, and Seungryong Kim
Under Review, 2025

Experience

2025–   **Adobe Research**
Research Scientist Intern (Mentors: Jui-Hsien Wang, Chongjian Ge, Zhifei Zhang)
Video diffusion models

2024–   **UW GRAIL**
Research Assistant (Supervisors: Steve Seitz, Brian Curless, Ira Kemelmacher-Shlizerman)
Immersive video/3D content production

2024   **Naver AI Lab**
Research Intern (Mentor: Jin-Hwa Kim)
(1) Effective rank regularization for 3DGS and (2) generative relighting

2023   **UW GRAIL**
Undergraduate Research Assistant (Supervisor: Ira Kemelmacher-Shlizerman)
Flexible 3D editing with generative trajectories

2023	**Twelve Labs**
	ML Research Intern (Mentor: Minjoon Seo)
	(1) Video-language model agents and (2) high-quality dataset
2022–2023	**CVLAB**
	Undergraduate Research Assistant (Supervisor: Seungryong Kim)
	Image, 3D, video generation, and neural fields

Honors and Awards

2024	**Graduate Student Conference Presentation Award**, University of Washington
2023	**Excellence Prize**, Capstone Design / Independent Study Competition, Korea University
2022	**National Science and Engineering Scholarship**, Korea Student Aid Foundation
2022	**Outstanding Paper Award**, Signal Processing Joint Conference of IEIE
2021	**Competition Expert (Highest Rank: 815th)**, Kaggle
2021	**Innovation Award (7,000,000 KRW)**, SK AI Challenge
2021	**Grand Prize**, KU Smart Campus Datathon, Korea University
2019	**Special Prize**, Secure Coding Contest, Ministry of Public Administration and Security
2019	**President's List**, Korea University
2019	**Dean's List**, Korea University

Services

2024–	**Conference Reviewer**, CVPR, NeurIPS, ICCV, ECCV, ICLR
2024–	**Journal Reviewer**, TIP
2023	**Significant Open Source Contribution**, Hugging Face Diffusers
2023	**AI Mentoring**, Kyung Hee High School
2020–2021	**Sergeant, Cybersecurity and AI**, Republic of Korea Army