

Susung Hong

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Research Interests

My research interests lie in the foundations of generative AI, including diffusion models and guidance, attention mechanisms, and model orchestration, as well as in their 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