Yintong Shang

shayito_@outlook.com | https://shayito.github.io/ | 1-801-645-2771 | Salt Lake City, Utah, 84107

Objective

I am a third-year Ph.D. student with research experience in the intersection of computer vision and graphics, focusing on 3D reconstruction and physics-based content generation. Skilled in communication and teamwork, with a proven ability to collaborate effectively in multidisciplinary environments. Seeking to apply expertise within the animation and gaming industry, contributing to the development of realistic and immersive visual experiences.

Education

University of Utah | Salt Lake City, Utah *2022.8-Present*
Ph.D. of Computing, Graphics and Visualization Track, GPA: *3.9/4.0, Advisor: Prof. Yin Yang*

University of Science and Technology of China (USTC) | Hefei, Anhui *2018.9-2022.6*
Bachelor of Engineering in Electronic Science and Technology, GPA: 3.68/4.3

Projects

Knowledge-driven Model for Physically Accurate Content Generation [Page] [Paper] 2024.3-2024.6
- Proposed an end-to-end 4D elastodynamics generative model, leveraging physics principles and mathematical optimization techniques for precise dynamics generation.
- Designed and developed a lightweight neural network with a physics-based solver backbone, achieving high accuracy in dynamics prediction with minimal data requirements.
- Enabled seamless integration with upstream and downstream deep modules for efficient end-to-end 4D generation across diverse hyperelastic materials.

Human Face Reconstruction 2023.10-2024.5
- Developed an optimization scheme to reconstruct human face geometry and texture from monocular videos, utilizing OpenCV, PyTorch, and 3D morphable models for precise reconstruction.
- Applied physics-based animation to simulate secondary facial motions, such as subtle skin deformations, ensuring lifelike expression dynamics.
- Trained a 3D Gaussian Splatting model to reconstruct realistic face textures, using PyTorch and CUDA for efficient training and high-quality rendering.

Physics-based NeRF Scene Deformation [Page] [Paper] 2023.5-2023.11
- Developed a physics-based, meshless elastic solver to manipulate neural radiance fields (NeRFs), employing adaptive partition and quadratic interpolation to enable precise scene deformation control.
- Implemented a quadratic ray-warping algorithm with GPU acceleration using CUDA, optimizing performance for real-time volume rendering.
- Achieved interactive frame rates for the simulation and rendering of deformed NeRFs, providing a versatile and efficient pipeline for applications in virtual reality (VR).

Skills

- Computer Graphics (CG): physics-based simulation (PBS), Newton's method, Projective Dynamics (PD), numerical optimization, collision handling, soft/rigid body simulation, cloth simulation.
- Computer Vision (CV): 3D reconstruction, differentiable rendering, neural implicit representations (NeRF, Gaussian Splatting), parametric human body and face model, generative AI.
- Programming: C/C++, Python (PyTorch, Tensorflow), CUDA, Warp Language, C#, MATLAB.

Publications

ElastoGen: 4D Generative Elastodynamics (Under Review) 2024.5
Yutao Feng*, Yintong Shang*, Xiang Feng*, Lei Lan, Shandian Zhe, Tianjia Shao, Hongzhi Wu, Kun Zhou, Hao Su, Chenfanfu Jiang, Yin Yang

Gaussian Splashing: Unified Particles for Versatile Motion Synthesis and Rendering (Under Review) 2024.1
Yutao Feng*, Xiang Feng*, Yintong Shang, Ying Jiang, Chang Yu, Zeshun Zong, Tianjia Shao, Hongzhi Wu, Kun Zhou, Chenfanfu Jiang, Yin Yang

PIE-NeRF: Physics-based Interactive Elastodynamics with NeRF (CVPR 2024) 2023.11
Yutao Feng*, Yintong Shang*, Xuan Li, Tianjia Shao, Chenfanfu Jiang, Yin Yang
* *for equal contribution.*