PENGHAO WANG

13162808180 | wangph1@shanghaitech.edu.cn | authoritywang.github.io | 2004 / 1 / 10

INTRODUCTION

I am pursuing an undergraduate degree in Computer Science and Technology at the School of Information Science and Technology, ShanghaiTech University. I'm also a student researcher at ShanghaiTech VRVC Lab where I am advised by Prof. Jingyi Yu and Prof. Lan Xu. I am passionate about exploring novel ideas and implementing them. My research interest lies in 3D vision and computer graphics with deep learning, including neural rendering, and dynamic scene reconstruction. Recently, I have focused on a compact representation of dynamic digital humans to enable streamable download and rendering on multi-platforms.

EDUCATION

ShanghaiTech University *2021-Present*
Bachelor Candidate, Major in Computer Science and Technology
GPA 3.65/4.0

EXPERIENCE

ShanghaiTech VRVC Lab, Student Researcher - Shanghai *2022.8 - Present*

- **NeRF Research**: Utilized PyTorch and JAX frameworks to replicate and optimize the NeRF(Neural Radiance Fields) paper, and accelerated MLP training and inference speed using CUDA.
- **Digital Human Reconstruction**: Extend the gaussian-splatting to dynamic human scenes via non-rigid tracking, enabling real-time, high fidelity, and compact representation of digital humans.
- **Cluster Administration**: Serve as the administrator of the VRVC 10 GPU clusters, including storage and IPMI management.

NeuDim Digital, Research Intern - Shanghai *2022.8 - Present*

- **NeRF Deploy**: Commercialize the NeRF and 3DGS algorithm by encapsulating it, optimizing it for multi-GPU servers, and developing efficient scheduling to make the most of the available computational resources.
- **Backend Develop**: Develop backend for the NeuRecon platform with python Flask, MySQL, Nginx, Aliyun package, and use K8s with docker to schedule the NeRF reconstruction service.

PUBLICATIONS

- V^3: Viewing Volumetric Videos on Mobiles via Streamable 2D Dynamic Gaussians
  Penghao Wang, Zhirui Zhang, Liao Wang, Kaixin Yao, Siyuan Xie, Jingyi Yu, Minye Wu, Lan Xu
  SIGGRAPH Asia 2024 (TOG)
- HiFi4G: High-Fidelity Human Performance Rendering via Compact Gaussian Splatting.
  Yuheng Jiang, Zhehao Shen, **Penghao Wang**, Zhuo Su, Yu Hong, Yingliang Zhang, Jingyi Yu, Lan Xu.
  CVPR2024 [**Arxiv Paper**]
- LetsGo: Large-Scale Garage Modeling and Rendering via LiDAR-Assisted Gaussian Primitives
  Jiadi Cui, Junming Cao, Yuhui Zhong, Liao Wang, Fuqiang Zhao, **Penghao Wang**, Yifan Chen, Zhipeng He, Lan Xu, Yujiao Shi, Yingliang Zhang, Jingyi Yu.
  [**Arxiv Paper**]

- NEPHELE: A Neural Platform for Highly Realistic Cloud Radiance Rendering.
  Haimin Luo, Siyuan Zhang, Fuqiang Zhao, Haotian Jing, **Penghao Wang**, Zhenxiao Yu, Dongxue Yan, Junran Ding, Boyuan Zhang, Qiang Hu, Shu Yin, Lan Xu, Jingyi Yu.
  [**Arxiv Paper**]

PROJECTS

NeuRecon platform backend

Built a backend for the NeuRecon 3D reconstruction platform. Support for user accounts, and flexible schedule of NeRF 3D reconstruction.

DynTCG: Monocular Dynamic Gaussian

Combining gaussian-splatting and 2D optical flow tracking to solve the reconstruction and rendering under monocular dynamic scene settings.

Volume Rendering with OpenGL in Real time

Reproduce Sparse Volume rendering with OpenGL. With fps to 3000+, it enables an interactive and smooth viewing experience even for large sparse scenes.

Neural Surface Reconstruction of Reflective object

Optimizing SDF network in NeuS with reflective-aware network to reconstruct glossy objects and obtain accurate geometry details.

LBM System accelerating

Accelerating a Lattice Boltzmann Method(LBM) system using Intel SIMD Extensions and Advanced Vector Extensions assembler instructions.

AWARDS

World Artificial Intelligence Conference Volunteer	*2023.07*
Shanghaitech University Merit Student	*2022.12*
National College Students Robot Contest National 3rd Prize	*2022.08*
Robomaster Super Tournament Regional Competition (Eastern Division) 2nd Prize	*2022.06*
Robomaster Intramural Competition Champion	*2021.12*

TECHNICAL SKILLS

Programming Languages	Python, C, C++, CUDA, JavaScript
Operating System	Ubuntu, Windows
DEV Tools	Visual Studio Code, Visual Studio, Pycharm, Matlab
Computer Graphics	OpenGL, Vulkan
Machine Learning	PyTorch, JAX
Backend	Flask, Docker, Kubernetes(K8s), SQL
Frontend	Vue, WebGL
Others	LATEX, Markdown, Git, Make, CMake