

# PENGHAO WANG

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## INTRODUCTION

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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 reconstruction and computer graphics with deep learning, including neural rendering, and dynamic scene reconstruction. Recently, I have focused on using neural radiance field based methods to perform real-time, reflection-aware object reconstruction and rendering.

## EDUCATION

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### ShanghaiTech University

2021-Present

Bachelor Candidate, Major in Computer Science and Technology

GPA 3.61/4.0

## EXPERIENCE

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### 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 3D-Gaussian-Splatting to dynamic human scenes by tracking, enabling real-time, high fidelity, and compact representation of digital humans.

### NeuDim Digital, Research Intern - Shanghai

2022.8 - Present

- **NeRF Deploy:** Commercialize the NeRF(Neural Radiance Fields) algorithm by encapsulating it, optimizing it for multi-GPU servers, and developing flexible scheduling to make the most of the available computational resources.
- **Backend Develop:** Develop backend for the NeuRecon platform with python Flask, MySQL, Nginx, Aliyun SMS, and Aliyun OSS, and use K8s with docker to schedule the NeRF reconstruction service.
- **DevOps Development:** Maintained a cluster of 10 GPU servers, managed the backend Kubernetes system, deployed Docker services, and configured Nginx. Additionally, set up a private ChatGPT service for internal company use.

## PUBLICATIONS

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- 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.  
Under Review [[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.  
(Submitted at SIGGRAPH 2023) [[Arxiv Paper](#)]

## PROJECTS

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### NeuRecon platform backend

Built a backend for the NeuRecon 3D reconstruction platform. Support for user accounts, and flexible schedule of NeRF 3D reconstruction. Using Apifox to achieve efficient communication with the frontend developer.

### 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.

### DynTCG: Monocular Dynamic Gaussian

Combining 3D-Gaussian-Splatting and 2D optical flow tracking to solve the reconstruction and rendering of monocular dynamic scenes settings.

### LBM System accelerating

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

### RISC-V assembler and simulator

Using C++ to build a RISC-V assembler, support for standard RISC-V instructions, with the function to load machine code and execute.

## AWARDS

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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

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<b>Programming Languages</b>	Python, C, C++, CUDA, HTML, JavaScript, Taichi, Matlab
<b>Operating System</b>	Windows, Ubuntu, Kali, MacOS
<b>DEV Tools</b>	Visual Studio Code, Visual Studio, Pycharm, Jupyter Notebook, Matlab, Unreal Engine, Adobe Photoshop
<b>Computer Graphics</b>	OpenGL, Vulkan, NVDiffrast
<b>Machine Learning</b>	PyTorch, JAX, Scikit
<b>Backend</b>	Flask, Kubernetes(K8s), Docker, SQL
<b>Frontend</b>	Vue, WebGL
<b>Others</b>	SSH, Git, Tmux, LATEX, Markdown, Make, CMake Vi, Vim, wrk, Nmap