

ZHANG SIYUAN

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🎓 EDUCATION

ShanghaiTech University, Shanghai, China Sep. 2019 – Present
Graduate in Computer Science (CS), expected Jun. 2023

👤 EXPERIENCE

L.I.O.N. & NeuDim ShanghaiTech University Nov. 2022 – Feb. 2023
Research Assistant

Co-authored **NEPHELE**: A Neural Platform for Highly Realistic Cloud Radiance Rendering, as the second author.

- Reduced hash grid size by **8.7** times by introducing **Perfect Spatial Hashing** into NGP.
- Developed a **multi-GPU, multi-node** extrem low latency NGP rendering framework, achieving **50 FPS @ 1080** resolution for **12** NGP on **4** GPUs in one node and **37 FPS @ 1080** resolution for **12** NGP on **4** GPUs in **2** nodes using **CUDA awared MPI**.

Geek_Pie HPC ShanghaiTech University Oct. 2020 – Present
Member

High Performance Computing (HPC) related research. Continually preparing and aiming for the top-tier student supercomputing competitions, including ASC, ISC and SC. Mainly in charge of HPC tasks related with AI, MPI and CUDA.

- **ASC21**: Implied and improved BERT on a cluster for a CLOZE job in ASC20.
- **ISC21, 8th Place**: Modified a GPU optimized **HPCC** benchmark, researched on MPI and OpenMP balance for **WRF** and contributed for **collective_profiler** a set of tools and libraries to profile Alltoallv MPI calls.
- **SC21, 2nd Place, Best Reproduction**: Mainly was in charge of **Reproduction** confirming the correctness of a SC research **ramBLe** and finished the **Mystery App Challenge** which contains running and tuning a multi-node DNN image segmentation application **CosmicTagger** and won the **second** place.
- **ISC22, 4th Place**: Working on optimization of **ICON** a MPI Program for earth system model, and won the **third highest score** of this problem.
- **ASC22, 1st Prize**: Using DeepSpeed to accelerate of YUAN A **Large Language Model** Pretrain Model, fine-tuned HPC benchmarks HPCG and HPL under restricted power constraints (**Best Score** with same hardware configuration), managing all hardware resources.

DEEMOS | MARS LAB ShanghaiTech University Dec. 2019 – Dec. 2020
Intern Software Engineer

MARS is a lab dedicated to exploring the integration and application of cutting-edge artificial intelligence and VFX in film and television.

- Used StyleGAN and Pix2Pix to train face style transformers and a face editor. Online demo: ANOME
- Implied interactive models in Looking Glass by C++ and Unity.

CS171: Computer Graphics ShanghaiTech University Sep. 2022 – Jan. 2023
Teaching Assistant

⚙️ OTHER PROJECTS

Fantanstic Movie Intel 2020 Hackathon Dec. 2020
Head of Machine Learning Part

Fantastic Movie is an awesome and GAN-based stylized live broadcast system with market potential. Won the second prize on Intel 2020 Hackathon.

- Processing online video streaming with Few Shot Patch Based Training to achieve a cost acceptable special live streaming solution.
- Real-time processing of 512 by 512 video @ 15 fps with low latency
- Application of the ANOME in video style transform

Course Projects ShanghaiTech University

Parallel Computing

- **Parallel StringArt** Using CUDA to transform a picture into a StringArt.
- **CuckooHashing** Using CUDA to implement a high performance hash algorithm.
- **Parallel BFS using OpenMP** Using OpenMP to implement BFS algorithm.

Computer Graphics

- **IsoSurface Visualize** Texture based pre integrated isosurface rendering which achieved **Highest Score**.
- **Assignment** OpenGL Practices & Ray tracing

Computer Vision

- **Assignments** OpenCV, Pytorch Practices

Distributed System / Computer Architecture III

- **DASH** : A Deadline Aware Scheduler of **Heterogeneous System** for AI Training Jobs

🔧 SKILLS

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|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| • Programming Languages:
Familiar: Python, C, C++, Javascript | • DevOps:
Docker, Linux |
| • Familiar Frameworks and Packages:
CUDA, OpenMP, MPI, OpenGL, OpenCV,
Pytorch | • Interests:
HPC, MLsys, ML acceleration, NeRF |
| • Development:
- HPC, Machine Learning | • Tools:
Nsight System, Nsight Compute, Intel Vtune,
Intel Trace Analyzer and Collector |

♥ HONORS AND AWARDS

<i>2nd Place</i> , SC Conference Series Student Cluster Competition 2021	Nov. 2021
<i>4th Place</i> , ISC High Performance Student Cluster Competition 2022	Jun. 2022
<i>8th Place</i> , ISC High Performance Student Cluster Competition 2021	Jun. 2021
<i>First Prize</i> , ASC Student Supercomputer Challenge Final 2022-2023	Apr. 2023
<i>2nd Prize</i> , 2020 Intel® Open Innovation Hackathon	Dec. 2020

🎓 PAPERS

G. Li et al., "Critique of "A Parallel Framework for Constraint-Based Bayesian Network Learning via Markov Blanket Discovery" by SCC Team from ShanghaiTech University," in IEEE Transactions on Parallel and Distributed Systems, 2022, doi: 10.1109/TPDS.2022.3205479.

Luo, H., Zhang, S., Zhao, F., Jing, H., Wang, P., Yu, Z., Yan, D., Ding, J., Zhang, B., Hu, Q., Yin, S., Xu, L., Yu, J. (2023). NEPHELE: A Neural Platform for Highly Realistic Cloud Radiance Rendering. ArXiv, abs/2303.04086.