Jingsen Zhu

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Education

Zhejiang University, Hangzhou, China 2021 – Present

M.S. student in Computer Science (CS), expected March 2024
Advisor: Prof. Yuchi Huo and Prof. Rui Wang
Collaborator: Dr. Fujun Luan and Prof. Qi Ye

Zhejiang University, Hangzhou, China 2017 – 2021

B.Eng. in Computer Science (CS), *GPA: 91.88/100, Rank: 1/154*
Advisor: Prof. Kai Bu

Research Interest

My research interests lie in the intersection between **computer graphics** and **3D vision**, including object and *scene level* **neural reconstruction**, **inverse rendering** and **scene editing**. I'm also interested in *image-based* **neural rendering** techniques to achieve fast and high-fidelity rendering results. I used to research on computer architecture and system security during my undergraduate years.

Publications

- Zhihua Zhong*, **Jingsen Zhu***, Yuxin Dai, Chuankun Zheng, Guanlin Chen, Yuchi Huo, Rui Wang, Hujun Bao, *FuseSR: Super Resolution for Real-time Rendering through Efficient Multi-resolution Fusion*, SIGGRAPH Asia 2023 (Conference Track) [Arxiv][Project]
- Xiangyu Wang*, **Jingsen Zhu***, Yunlong Ran, Zhihua Zhong, Yuchi Huo, Jiming Chen, Qi Ye, *Seal-3D: Interactive Pixel-Level Editing for Neural Radiance Fields*, ICCV 2023 [Arxiv][Project] [Code]
- **Jingsen Zhu**, Yuchi Huo, Qi Ye, Fujun Luan, Jifan Li, Dianbing Xi, Lisha Wang, Rui Tang, Wei Hua, Hujun Bao, Rui Wang, *I^2-SDF: Intrinsic Indoor Scene Reconstruction and Editing via Raytracing in Neural SDFs*, CVPR 2023 [Arxiv][Project] [Code]
- **Jingsen Zhu**, Fujun Luan, Yuchi Huo, Zihao Lin, Zhihua Zhong, Dianbing Xi, Rui Wang, Hujun Bao, Jiaxiang Zheng, Rui Tang, *Learning-based Inverse Rendering of Complex Indoor Scenes with Differentiable Monte Carlo Raytracing*, SIGGRAPH Asia 2022 (Conference Track) [Arxiv][Project]
- **Jingsen Zhu**, Mengming Li, Xingjian Zhang, Kai Bu, Miao Zhang, Tianqi Song, *Hitchhiker: Accelerating ORAM with Dynamic Scheduling*, IEEE Transactions on Computers (TC), 2022 [Paper]

Experience and Projects

Research Intern: Computer Architecture 2019 – 2021

Advisor: Prof. Kai Bu

- Designed an efficient oblivious RAM scheme to protect memory access pattern from side-channel attacks.
- Accepted by IEEE Transactions on Computers in 2022.

Teaching Assistant: Operating System 09/2020 – 12/2020

- Participated in designing the coursework of Operating System: A toy Linux-like operating system written by C and RISC-V assembly running on microcontroller unit (MCU).
- Implemented system interrupt, system call, and virtual memory management.

Inverse rendering for complex indoor scenes from a single image 09/2021 – 05/2022

Advisor: Prof. Yuchi Huo and Prof. Rui Wang
Collaborator: Dr. Fujun Luan

- Proposed a learning-based approach to disentangle material, geometry and illumination from a single indoor scene image, enabling applications including material editing and object insertion.

- Leverage *screen-space raytracing* and *Monte-Carlo rendering* to achieve photo-realistic results, especially on specular surfaces.
- Published in SIGGRAPH Asia 2022 conference track.

Indoor scene 3D reconstruction and intrinsic decomposition 06/2022 – 11/2022

Advisor: Prof. Yuchi Huo and Prof. Rui Wang
Collaborator: Dr. Fujun Luan

- Proposed a neural SDF-based method to reconstruct the geometry, appearance, material and lighting from multi-view indoor scene images, enabling 3D reconstruction, novel-view synthesis and scene editing.
- Addressed the challenges in reconstructing *thin structures* within the scene, by a novel *bubble loss*.
- Published in CVPR 2023.

Neural super-resolution for realtime rendering 11/2022 – 05/2023

Advisor: Prof. Yuchi Huo and Prof. Rui Wang
Collaborator: Zhihua Zhong

- Proposed a neural super-resolution method that efficiently fuses G-Buffer information, outperforming baselines in *both quality and speed* with a large margin.
- The first method to produce high-fidelity results in the challenging 8×8 super-resolution task.
- Accepted by SIGGRAPH Asia 2023 conference track.

Interactive pixel-level NeRF editing 12/2022 – 03/2023

Advisor: Prof. Yuchi Huo and Prof. Qi Ye
Collaborator: Xiangyu Wang

- Proposed a NeRF editing method supporting both geometry and color manipulation, achieving interactive convergence speed *in seconds*.
- Published in ICCV 2023.

AWARDS

- National Scholarship 10/2023
- "Outstanding Master Student" Honorary Title 09/2023
- Outstanding Graduate Award 06/2021
- Outstanding Undergraduate Thesis 06/2021
- "Academic Star" Honorary Title of CS department, ZJU (10/300+) 09/2020
- Zhejiang Province Scholarship 10/2018 and 10/2019

SKILLS

- Programming Languages: C/C++, Python, CUDA, GLSL, Java, Assembly
- Tools: PyTorch, Mitsuba, LaTeX, Markdown
- Mathematics: Probability Theory (95/100), Stochastic Process (96/100), Mathematical Physics Methods (99/100), Applied Operations Research (95/100)

MISCELLANEOUS

- Technical Paper Reviewer
  - ACM SIGGRAPH 2023
  - IEEE TVCG 2023
  - Computational Visual Media 2023
- Languages: English - Fluent, Mandarin and Cantonese - Native speaker