

# Junchen Liu

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## EDUCATION

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### Beihang University

*BEng. in Computer Science and Technology*

GPA: 3.89/4.0 (top 5%)

Core Course: Optimization in CS, Parallel programming, Computer Graphics, and Digital Image Processing

Beijing, China

Sept. 2020 – June 2024

### University of California, Berkeley

Visiting student

Courses: CS284B

Berkeley, CA, USA

Jan. 2024 - Present

## RESEARCH EXPERIENCES

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### Rip-NeRF (SIGGRAPH 2024, conference track)

Nov. 2023 – Jan. 2024

*Position: first author*

*Supervisor: Assistant Professor [Hao Zhao](#), [Wenbo Hu](#)*

*Lab: Institute for AI Industry Research, Tsinghua University*

- Proposed a novel 3D space factorization method, Platonic Solid Projection to represent 3D scene with the 2D faces of a Platonic Solid to distinguish anisotropic 3D Gaussians.
- Represented the faces of platonic solid by Ripmap Encoding to enable anisotropic area-sampling
- Achieved higher PSNR than [Zip-NeRF](#) while maintaining efficient reconstruction on both the blender and real-world captured dataset and reached a flexible trade-off between rendering quality and efficiency.

### Neural Refractive-Reflective Fields

Jun. 2023 – Sept. 2023

(has been submitted to TPAMI in September 2023, arxiv link: <https://arxiv.org/abs/2309.13039>)

*Position: co-first author*

*Supervisor: Assistant Professor [Hao Zhao](#)*

*Lab: Institute for AI Industry Research, Tsinghua University*

- Used Ray-Tracing and Neural-based methods to achieve few-shot new view synthesis of transparent objects
- Geometry estimation: Optimized the object geometry defined by SDF using object mask prior supervision and converted the SDF to an explicit mesh using DMTet
- Environment map estimation: Froze the obtained SDF information and optimize NeRF to obtain environment texture mapping (each ray is sampled only once) for environment map estimation

### Staged Gaze Prediction in VR Environment

Mar. 2023 – Jun. 2023

(has been accepted by CAD/CG 2023, in the process of being submitted to TVCG.)

*Position: The second author*

*Supervisor: Associate Professor [Miao Wang](#)*

*Lab: State Key Laboratory of Virtual Reality Technology and Systems, Beihang University*

- Executed user experiments and gathered data on parameters like rotational velocity during three-step grasping
- Analyzed the correlation between these parameters and the users' gaze position using SPSS
- Conducted ANOVA on stage-wise data to assess inter-stage differences, selected several attributes with highest correlation, and used them as the input for the neural network to predict gaze

## **PROJECT EXPERIENCES**

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### **Tri-MipRF Nerfstudio Integration**

*Github link:* [trimiprf\\_nerfstudio](https://github.com/trimiprf/nerfstudio)

## **SELECTED AWARDS AND SCHOLARSHIPS**

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- Meritorious Winner, Interdisciplinary Contest in Modeling 2023 (Top 7.09%) May 2023
- Grand Prize of Study Scholarship (Top 3%) 2021 - 2022
- Grand Prize of Competition Scholarship 2021 - 2022
- First Prize, Beijing Division, The Chinese Mathematics Competition 2022 Dec. 2022
- National First Prize, Undergraduate Mathematical Contest in Modeling (**Top 0.65%**). Nov. 2022
- National Scholarship (**Top 1%** highest scholarship from Ministry of Education of China) Oct. 2022
- First Prize, Beijing Division, The Chinese Mathematics Competition 2021 Dec. 2021
- Second Prize, National Professional Software Engineering “Lanqiao Cup” Design Contest May 2021

## **ADDITIONAL INFORMATION**

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- Computer skills: Proficient in Python, C, C++, CUDA, Java, Go and intermediate in Unity and MATLAB
- Language skills: Chinese (Native Speaker), English (fluent)
- Standard tests: IELTS: 7.0, GRE: V150+Q170