Xianrui Luo

Homepage

Google Scholar

@ Email: xianruiluo@outlook.com

Biography

I am a postdoctoral researcher (Shuimu Scholar) at the Institute of Future Cities and Infrastructures, Tsinghua University, where I work with Prof. Dongping Fang. I received my Ph.D. degree from the School of Artificial Intelligence and Automation, Huazhong University of Science and Technology, supervised by Prof. Zhiguo Cao. My research interests lie in (1) 3D vision and image manipulation, with a particular emphasis on computational photography; (2) multimodal language models and their applications in construction automation.

Current Employment and Working Experience

Postdoctoral Researcher | Institute of Future Cities and Infrastructures, Tsinghua University Aug 2025 – Now
Working with Prof. Dongping Fang. I lead a project on multi-modal LLMs in construction safety.

Project Officer | S-Lab for Advanced Intelligence, Nanyang Technological University Nov 2023 – Nov 2024
Advisor: Prof. Guosheng Lin. I lead a project on high-fidelity human avatar modeling.

Education

Huazhong University of Science and Technology, China Sep 2020 – Jun 2025
Doctor of Artificial Intelligence *GPA:* ***90.19***

Huazhong University of Science and Technology, China Sep 2016 – Jun 2020
Bachelor of Automation *GPA:* ***89.2***

Publications

Journal Articles

Defocus to Focus:
Photo-realistic Bokeh Rendering by Fusing Defocus and Radiance Priors **Information Fusion** 2023
Xianrui Luo*, Juewen Peng*, Ke Xian, Zijin Wu, Zhiguo Cao (*Equal Contribution)* [Paper] [Code]

Point-and-Shoot All-in-Focus Photo Synthesis From Smartphone Camera Pair **IEEE TCSVT** 2023
Xianrui Luo*, Juewen Peng, Weiyue Zhao, Ke Xian, Hao Lu, Zhiguo Cao* [Paper]

Dual-Camera All-in-Focus Neural Radiance Fields **IEEE TPAMI** 2025
Xianrui Luo*, Zijin Wu, Juewen Peng, Huiqiang Sun, Zhiguo Cao, Guosheng Lin* [Paper] [Code]

BokehMe++: Harmonious Fusion of Classical and Neural Rendering for Versatile Bokeh Creation **IEEE TPAMI** 2024
Juewen Peng, Zhiguo Cao, ***Xianrui Luo****, Ke Xian, Wenfeng Tang, Jianming Zhang, Guosheng Lin* [Paper]

Conference Papers

Dynamic Neural Radiance Field From Defocused Monocular Video **ECCV** 2024
Xianrui Luo*, Huiqiang Sun, Juewen Peng, Zhiguo Cao* [Paper][Code]

Bokeh Rendering from Defocus Estimation **ECCVW** 2020
Xianrui Luo*, Juewen Peng*, Ke Xian, Zijin Wu, Zhiguo Cao (*Equal Contribution)* [Paper]

Interactive Portrait Bokeh Rendering System **ICIP** 2021
Juewen Peng, ***Xianrui Luo****, Ke Xian, Zhiguo Cao* [Paper]

BokehMe: When Neural Rendering Meets Classical Rendering **CVPR** 2022
Juewen Peng, Zhiguo Cao, ***Xianrui Luo****, Hao Lu, Ke Xian, Jianming Zhang* [Paper][Code]

MPIB: An MPI-Based Bokeh Rendering Framework for Realistic Partial Occlusion Effects **ECCV** 2022
Juewen Peng, Jianming Zhang, ***Xianrui Luo****, Hao Lu, Ke Xian, Zhiguo Cao* [Paper][Code]

Fast Full-frame Video Stabilization with Iterative Optimization **ICCV** 2023
Weiyue Zhao, Xin Li, Zhan Peng, ***Xianrui Luo****, Xinyi Ye, Hao Lu, Zhiguo Cao* [Paper][Code]

Selective Bokeh Effect Transformation **CVPRW** 2023
Juewen Peng, Zhiyu Pan, Chengxin Liu, ***Xianrui Luo****, Huiqiang Sun, Liao Shen, Ke Xian, Zhiguo Cao* [Paper][Code]

Project

S-Lab Funding Project on Human Avatar Modeling Nov 2023 – Nov 2024
I serve as a core member responsible for:

1. collecting the datasets required for the character animation task. I also clean the collected data to ensure its accuracy and availability, and provide a high-quality foundation for the subsequent training of the action generation model.

2. capturing and synthesizing data for the human avatar modeling task. I conduct research on high-fidelity human avatar reconstruction, collaborating closely with team members.

NTIRE 2023 Challenge on Bokeh Effect Transformation (CVPR2023 Workshop) Jun 2023
Winner Award

Vivo Funding Project on Simulation of Bokeh Effect from DSLR Jan 2023 – Dec 2023
I serve as a core member responsible for realistic bokeh synthesis for smartphone photography, I analyze experimental results and provide ideas to improve visualizations.

AIM 2020 Challenge on Rendering Realistic Bokeh (ECCV2020 Workshop) Aug 2020
Runner Up Award

Awards and Honors

National Scholarship (1% of all students)	*Huazhong University of Science and Technology*	2024
Academic Scholarship	*Huazhong University of Science and Technology*	2020 – 2024
Outstanding Graduates	*Huazhong University of Science and Technology*	2020
Merit Student (5% of all students)	*Huazhong University of Science and Technology*	2016, 2023
Best Poster Award	*Artificial Intelligence Conference and Entrepreneurs Summit Forum of China's Optics Valley*	2022

Skills

Programming Language
Python, MATLAB, C

Machine Learning Tools
PyTorch, OpenCV

English
TOEFL 109, GRE 325 (AW 4.0)