Pengfei Shen

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Google Scholar

Research Interests

Computational Imaging, Differentiable Rendering, Realistic Rendering

Education

Ph.D. Electrical and Computer Engineering, The University of Hong Kong, 2024–present
Advised by Prof. Yifan (Evan) Peng

M.S. Applied Mathematics, University of Science and Technology of China, 2021–2024
Advised by Prof. Ligang Liu

B.S. Physics, University of Science and Technology of China, 2017–2021
Dual B.E. in Computer Science
Thesis: *An Improved Rendering Method: Consideration of Optical Polarization Effect in Scattering Process*

Publications

Li Liao†, **Pengfei Shen**†, and Yifan (Evan) Peng (2026). "Boundary-aware Neural Model Reduction for PDEs". In: *ACM SIGGRAPH Conference Papers 2026*. DOI: 10.1145/3799902.3811153.

Zixuan Li†, **Pengfei Shen**†, Hanxiao Sun, Zibo Zhang, Yu Guo, Ligang Liu, Ling-Qi Yan, Steve Marschner, Milos Hasan, and Beibei Wang (2026). "Fiber-level Woven Fabric Capture from a Single Microscopic Image". In: *ACM Transactions on Graphics (TOG)* 45.4.

Zhenyang Li†, Xiaoyang Bai†, Tongchen Zhang, **Pengfei Shen**, Weiwei Xu, and Yifan (Evan) Peng (2025). "Enhanced Velocity Field Modeling for Gaussian Video Reconstruction". In: *Proceedings of IEEE ISMAR 2025*.

Pengfei Shen, Feifan Qu, Li Liao, Ruizhen Hu, and Yifan (Evan) Peng (2025). "S^3 Imagery: Specular Shading from Scratch-Anisotropy". In: *Proceedings of ACM SIGGRAPH Asia 2025 (Technical Papers)*.

Zhenyang Li†, Xiaoyang Bai†, Jinfan Lu, **Pengfei Shen**, Edmund Y. Lam, and Yifan (Evan) Peng (2025). "EventTracer: Fast Path Tracing-based Event Stream Rendering". In: *arXiv preprint arXiv:2508.18071*.

Feifan Qu, **Pengfei Shen**, Li Liao, and Yifan (Evan) Peng (2025). ""Hands-on" Light Field Display via Engineering Scalable Optics, Algorithms, and Mounts". In: *Proceedings of ACM SIGGRAPH Asia 2025 (XR)*.

Xuchen Wei, Yuchi Huo, **Pengfei Shen**, Yifan Peng, Hujun Bao, and Rui Wang (2025). "Regulation-Aware Freeform Headlamp Reflector Design with Differentiable Ray Tracing". In: *Optics Express*.

Ruizeng Li, Xinyang Liu, Runze Wang, **Pengfei Shen**, Ligang Liu, and Beibei Wang (2025). "Bidirectional Plateau-Border Scattering Distribution Function for Realistic and Efficient Foam Rendering". In: *Proceedings of EGSR 2025*.

Pengfei Shen†, Ruizeng Li†, Beibei Wang, and Ligang Liu (2023). "Scratch-based Reflection Art via Differentiable Rendering". In: *ACM Transactions on Graphics (Proceedings of SIGGRAPH 2023)* 42.4, pp. 1–12.

Tao Zhuang, **Pengfei Shen**, Beibei Wang, and Ligang Liu (2021). "Real-time Denoising Using BRDF Pre-integration Factorization". In: *Computer Graphics Forum* 40.7, pp. 173–180. DOI: https://doi.org/10.1111/cgf.14411.

†Equal contribution.

Experience

2023 **Technology Researcher Intern**, Tencent Games, Shenzhen, China
Worked on a differentiable renderer for 3D modelling tasks.

2023 **Research Assistant**, Nankai University, Tianjin, China
Participated in a woven fabric reconstruction project; wrote a path tracer rendering billions of fibers at interactive framerates. Collaborated with researchers from UCSB, Adobe, and Cornell.

2022 **Graphics Engineer Intern**, MiHoYo Co. Ltd., Shanghai, China
Implemented *Tessellation-Free Displacement Mapping for Ray Tracing* into Unreal Engine.

Teaching

2024 **Teaching Assistant**, Computer Graphics, University of Science and Technology of China
Lecturer: Prof. Ligang Liu. Main contributor to the course code skeleton.

2022 **Teaching Assistant**, Computational Imaging (GAMES 204), Online
Lecturer: Prof. Qilin Sun & Prof. Evan Peng.

2020–21 **Teaching Assistant**, Physics Experiments, USTC
Designed the open-ended experiment problems.

Talks

2023 *Scratch-based Reflection Art via Differentiable Rendering*, GAMES Seminar, Online

2020 *Real-time Denoising Using BRDF Pre-integration Factorization*, Pacific Graphics 20+21, Online

Awards

2024 USTC Outstanding Teaching Assistant

2023 Chinese National Scholarship (top 5%)

2023 First Place, CSIG Image and Graphics Challenge — AMD Fluid Simulation Track

2019 First Prize, China Undergraduate Physics Tournament

Skills

Programming C++, CUDA, Python, Vulkan, Unreal Engine, OpenUSD

Modelling Blender, Houdini

Languages Chinese (Native), English (Fluent)

Updated June 2026