Kai Yan

kyan8@uci.edu | yank.ai

Education

University of California, Irvine Jun. 2020 – Present
Ph.D. candidate in Computer Science Irvine, CA

- **Research**: Differentiable Rendering
- **Advisor**: Shuang Zhao

University of California, Irvine Sep. 2016 – Mar 2020
Bachelor of Science in Computer Science && Computer Game Science Irvine, CA

- **Minor**: Film and Media Studies
- **Research**: Computer Graphics, Machine Learning, Computer Vision
- **Advisor**: Shuang Zhao
- **Thesis**: Path-Space Differentiable Renderer (PSDR-CUDA)

Publications

Image-Space Adaptive Sampling for Fast Inverse Rendering

Kai Yan, Cheng Zhang, Sébastien Speierer, Guangyan Cai, Yufeng Zhu, Zhao Dong, Shuang Zhao

SIGGRAPH 2025, July 2025

Differentiating Variance for Variance-Aware Inverse Rendering

Kai Yan, Vincent Pegoraro, Marc Droske, Jiří Vorba, Shuang Zhao

SIGGRAPH ASIA 2024, Dec 2024

PSDR-Room: Single Photo to Scene using Differentiable Rendering

Kai Yan, Fujun Luan, Miloš Hašan, Thibault Groueix, Valentin Deschaintre, Shuang Zhao

SIGGRAPH ASIA 2023, Dec 2023

Neural-PBIR Reconstruction of Shape, Material, and Illumination

Cheng Sun, Guangyan Cai, Zhengqin Li, **Kai Yan**, Cheng Zhang, Carl Marshall, Jia-Bin Huang, Shuang Zhao, Zhao Dong

International Conference on Computer Vision (**ICCV 2023**), October 2023

Efficient Estimation of Boundary Integrals for Path-Space Differentiable Rendering

Kai Yan, Christoph Lassner, Brian Budge, Zhao Dong, and Shuang Zhao

ACM Transactions on Graphics (**SIGGRAPH 2022**), 41(4), July 2022

Physics-Based Inverse Rendering using Combined Implicit and Explicit Geometries

Guangyan Cai, **Kai Yan**, Zhao Dong, Ioannis Gkioulekas, and Shuang Zhao

Computer Graphics Forum (**EGSR 2022**), 41(4), July 2022

Path-Space Differentiable Rendering

Cheng Zhang, Bailey Miller, **Kai Yan**, Ioannis Gkioulekas, and Shuang Zhao

ACM Transactions on Graphics (**SIGGRAPH 2020**), 39(4), July 2020

Systems

PSDR-JIT (PSDR-CUDA)

- Authors: **Kai Yan**, Shuang Zhao
- https://github.com/andyyankai/psdr-jit
- PSDR-Jit is a GPU based differentiable renderer using Optix 7 for ray tracing and Drjit for reverse-mode automatic differentiation. It have been used in several SIGGRAPH/EGSR/CVPR/ICCV projects

Experiences

Nvidia Research Jun. 2025 –
Research Intern Redmond, WA

- Collaborators: TBA
- Topic: Differentiable Rendering for real-time rendering

Meta Reality Lab Jun. 2024 – Oct. 2024
Research Intern Redmond, WA

- Collaborators: Cheng Zhang, Sébastien Speierer
- Topic: Differentiable Rendering for content creation

Weta Digital x Unity Jul. 2023 – Dec. 2023
Research Intern Wellington, NZ

- Collaborators: Marc Droske, Vincent Pegoraro, Jiri Vorba
- Topic: Differentiable Rendering for production @ SIGGRAPH ASIA 2023 & Manuka/Avator 3

MiHoYo Feb. 2023 – Jun. 2023
Research Intern Shanghai, CN

- Topic: Differentiable rendering for AI Game @ Lumi Research

Adobe Research Jun. 2022 – Oct. 2022
Research Intern San Jose, CA

- Collaborators: Milos Hasan, Fujun Luan, Valentin Deschaintre
- Topic: Differentiable rendering for scene reconstruction @ SIGGRAPH ASIA 2023

Meta Reality Lab Jun. 2021 – Feb. 2022
Research Intern Redmond, WA

- Collaborators: Zhao Dong, Christoph Lassner, Brian Budge
- Topic: Differentiable rendering for shape/material reconstruction @ SIGGRAPH 2022 & Meta Connect 2022

Professional Activities

Program Committee : Eurographics Symposium on Rendering (EGSR)
Reviewer : ACM SIGGRAPH, ACM SIGGRAPH ASIA, ACM Transactions on Graphics (TOG), Eurographics, Computer Graphics Forum, Computer & Graphics

Teaching

CS 114 : Advanced 3D Computer Graphics (TA)
CS 112 : COMPUTER GRAPHICS (TA)
ICS 162 : Modeling and World Building (TA)
ICS 33 : INTERMEDIATE PRGRMG (TA)
ICS 45C : PROGRAM IN C/C++ (TA)
ICS 32 : PROG SOFTWARE LIBR (TA)