

# Kai Yan

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## Education

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### University of California, Irvine

*Ph.D. candidate in Computer Science*

Jun. 2020 – Present

Irvine, CA

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

### University of California, Irvine

*Bachelor of Science in Computer Science && Computer Game Science*

Sep. 2016 – Mar 2020

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

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### 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

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### PSDR-JIT (PSDR-CUDA)

- Authors: **Kai Yan**, Shuang Zhao
- <https://github.com/andyankai/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

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### Meta Reality Lab

*Research Intern*

Jun. 2024 –  
Redmond, WA

### Weta Digital x Unity

*Research Intern*

Jul. 2023 – Dec. 2023  
Wellington, NZ

- Collaborators: Marc Droske, Vincent Pegoraro, Jirka Vorba
- Topic: Differentiable Rendering support for production.

### MiHoYo

*Research Intern*

Feb. 2023 – Jun. 2023  
Shanghai, CN

- Topic: Differentiable Rendering support for Artist/Game development

### Adobe Research

*Research Intern*

Jun. 2022 – Oct. 2022  
San Jose, CA

- Collaborators: Milos Hasan, Fujun Luan, Valentin Deschaintre
- Topic: Scene Level Inverse Rendering with Learning Priors and Physics-Based Differentiable Rendering.

### Meta Reality Lab

*Research Intern*

Jun. 2021 – Feb. 2022  
Redmond, WA

- Collaborators: Zhao Dong, Christoph Lassner, Brian Budge
- Topic: Object Level Inverse Rendering using Physics-Based Differentiable Rendering.

## Professional Activities

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**Program Committee** : Eurographics Symposium on Rendering (EGSR)

**Reviewer** : ACM SIGGRAPH, ACM SIGGRAPH ASIA, ACM Transactions on Graphics (TOG), Eurographics, Computer Graphics Forum

## Teaching

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**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)

## Skills

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**Languages** : C/C++, Python, Matlab, Mathematica

**Tools** : CUDA, PyTorch, Optix, Mitsuba, Blender, Unity, Unreal

**Hobbies** : Cat, Animal, Anime, Games, Movies, CG, Art, Modeling, Piano