Zitian Zhang

PhD Candidate, Université Laval

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Education

PhD Candidate in Computer Science, Université Laval, Canada 2023 – Present

– Research with Prof. Jean-François Lalonde, Computer Vision and Systems Lab

– Research interest: Object compositing, image relighting, diffusion models, light estimation

– Topic: Image Compositing and Relighting via Generative Models

M.Eng. in Computer Technology, South China University of Technology, China 2020 – 2023

– Research with Assoc. Prof. Chuhua Xian, Multimedia Lab

– Research interest: Consistent depth estimation, indoor light estimation

B.Mgmt. in E-Commerce, Xidian University, China 2020 – 2023

– GPA: 3.7/4.0, top 5%

Publications

[1] **Z. Zhang**, I. Georgiev, M. Fischer, Y. Hold-Geoffroy, J.-F. Lalonde, and V. Deschaintre, "Unilight: A unified representation for lighting," *arXiv preprint arXiv:2512.04267*, 2025

[2] F. Fortier-Chouinard, **Z. Zhang**, L.-E. Messier, M. Garon, A. Bhattad, and J.-F. Lalonde, "Spotlight: Shadow-guided object relighting via diffusion," in *2026 International Conference on 3D Vision (3DV)*, 2026, [project page]

[3] **Z. Zhang**, J. U. Davis, J. P. A. Vu, J. Kuang, and J.-F. Lalonde, "Improving the color accuracy of lighting estimation models," in *Color and Imaging Conference (CIC)*, 2025, **Oral Presentation**, [project page]

[4] **Z. Zhang**, F. Fortier-Chouinard, M. Garon, A. Bhattad, and J.-F. Lalonde, "Zerocomp: Zero-shot object compositing from image intrinsics via diffusion," in *2025 IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, 2025, **Oral Presentation**, [project page]

[5] Y. Liang, **Z. Zhang**, C. Xian, and S. He, "Delving into multi-illumination monocular depth estimation: A new dataset and method," *IEEE Transactions on Multimedia*, 2024, [project page]

[6] C. Xian, K. Qian, **Z. Zhang**, and C. C. Wang, "Multi-scale progressive fusion learning for depth map super-resolution," *arXiv preprint arXiv:2011.11865*, 2020

Research Experience

PhD Candidate, Université Laval Sep. 2023 – Present

SpotLight: Local Lighting Control with Shadows via Diffusion

– Used shadow maps as guidance to achieve precise and training-free local relighting

ZeroComp: Zero-shot Object Compositing via Diffusion

– Tackled the challenge of enabling realistic 3D object compositing without relying on paired composite-scene image datasets

– Designed and implemented a diffusion-based model trained solely on synthetic indoor RGB and intrinsic dataset, while generalizing well across various scenes

– Created an evaluation dataset, featuring automatically generated, realistic object composites

Research Scientist Intern, Adobe Research London Jun. 2025 – Aug. 2025

– Proposed UniLight, a unified lighting representation framework that aligns text, images, irradiance, and environment maps into a joint latent space using contrastive learning

– Enabled down-stream applications such as lighting-based retrieval, environment-map generation, and lighting control in diffusion-based image synthesis

Research Assistant, Meta and Université Laval Sep. 2024 – Apr. 2025

– Developed a light estimation pipeline with WB correction models to improve color accuracy

Master's Student, South China University of Technology Sep. 2020 – Jun. 2023

– Introduced a single-view multi-illumination RGB-D dataset

– Developed a post-processing module, enabling a robust and consistent depth prediction in changing illuminations

Patents

Zitian Zhang, Frédéric Fortier-Chouinard, Mathieu Garon, Anand Bhattad, and Jean-François Lalonde. *Systems and Methods for Compositing a Virtual Object in a Background Image.* U.S. Provisional Patent Application N° 63/705,195, filed October 9, 2024. (in application)

Skills

Python, C++, PyTorch, Blender, Unreal Engine
Diffusion Models, Image Compositing, Image Light Control, Light Estimation

Service

3DV reviewer Aug. 2025 - Present
TVCG reviewer Nov. 2024 - Present

Other work experience

Game Developer Intern, Alibaba Lingxi Interactive, China Jun. 2022 – Aug. 2022

– Independently created a functional and engaging mini simulation game using UE 4, driven by a passion for games and rendering

– Designed and implemented the scene setup, game logic, and UI with UE 4 blueprints and C++

– Developed a basic AI for NPCs using behavior trees to ensure smooth and dynamic gameplay

Rendering Developer Intern, Revobit, China Dec. 2021 – May. 2022

– Developed high-quality, photo-realistic rendering solutions tailored to the digital fashion industry, enhancing the presentation of apparel and accessories

– Optimized the real-time rendering system and customized shader pipelines for a physically-based rendering framework