Tianfu Wang

+1 240-839-0178 | tianfuw@umd.edu | https://tianfwang.github.io/

Research Interest

I am interested in developing intelligent systems for computer vision and computational imaging. I work on generative models for imaging and vision. I adapt large pretrained diffusion and vision-language models to solve problems in computational imaging and visual perception: removing reflections and scattering media, estimating depth and geometry, and keeping perception robust under adverse capture conditions.
I am seeking summer 2027 research internships.

Education

University of Maryland — **College Park, MD, USA**
Ph.D. student, Computer Science, GPA 4.0/4.0 — 08. 2024 –

ETH Zurich — **Zurich, Switzerland**
M.S. in Computer Science, with distinction, GPA 5.75/6.0 — 09. 2021 – 07.2024

Northwestern University — **Evanston, IL, USA**
B.S. in Computer Science and Mathematics, Magna Cum Laude, GPA 3.94/4.0 — 09. 2017 – 06. 2021

Experience

Dolby Labs Inc. — 05. 2026 - 08.2026
PhD Summer Research Intern

- Generative Dolby Vision, working with Tsung-Wei Huang and Guan-ming Su.

Intelligent Sensing Lab, University of Maryland, College Park — 08. 2024 -
Research Assistant

- Computer Science Ph.D. Student supervised by Prof. Christopher Metzler
- Developed novel diffusion-model-based image restoration approaches for flash photography reflection removal and underwater image restoration.

ETH Zurich — 07. 2023 – 07.2024
Research Assistant

- Master's thesis supervised by Prof. Konrad Schindler
- Developed fast and resolution-agnostic diffusion image generation methods, with applications in monocular depth estimation, 3D generation, and domain generalization.
- Worked with Menelaos Kanakis and Anton Obukhov on neural radiance fields and diffusion models, supervised by Prof. Luc Van Gool

Computational Photography Lab, Northwestern University — 01. 2020 – 09.2021
Research Assistant

- Worked with Prof. Oliver Cossairt and Prof. Florian Willomitzer on structured light imaging and eye tracking with deflectometry.

Selected Publications

* Denotes equal contribution

Enhancing Vision Language Models' Robustness Under Adverse Imaging Conditions
Tianfu Wang*, Mingyang Xie*, Haoming Cai, Tianyi Xiong, Xiyao Wang, Dongdong Fu, Guan-Ming Su, Paola Cascante-Bonilla, Christopher Metzler
COLM, 2026

WaterGen: Decoupling Scene and Medium in Underwater Image Generation
Tianfu Wang*, Jiayi Wu*, Tianyi Xiong, Dehao Yuan, Xiaomin Lin, Md Jahidul Islam, Cornelia Fermüller, Christopher A. Metzler, Yiannis Aloimonos
ECCV, 2026

PolarDepth: Polarization-Guided Monocular Depth for Visual Odometry
Naitri Rajyaguru, **Tianfu Wang**, Aryan Tajne, Botao He, Jiayi Wu,
Cornelia Fermuller,Christopher Metzler, Yiannis Aloimonos
IEEE RA-L, 2026

LaVR: Scene Latent Conditioned Generative Video Trajectory Re-Rendering using Large 4D Reconstruction Models
Mingyang Xie, Numair Khan, **Tianfu Wang**, Naina Dhingra, Seonghyeon Nam,
Haitao Yang, Hui Zhuo, Christopher Metzler, Andrea Vedaldi, Hamed Pirsiavash, Lei Luo
CVPR, 2026

Single-Step Latent Diffusion for Underwater Image Restoration
Tianfu Wang*, Jiayi Wu*, Md Abu Bakr Siddique, Md Jahidul Islam, Cornelia Fermuller,
Yiannis Aloimonos, Christopher A. Metzler
IEEE TPAMI & ICCP, 2025

Marigold: Affordable Adaptation of Diffusion-Based Image Generators for Image Analysis
Tianfu Wang*, Bingxin Ke*, Kevin Qu*, Nando Metzger*, Shengyu Huang, Bo Li,
Anton Obukhov*, Konrad Schindler
IEEE TPAMI, 2025

Flash-Split: 2D Reflection Removal with Flash Cues and Latent Diffusion Separation
Tianfu Wang*, Mingyang Xie*, Haoming Cai, Sachin Shah, Christopher A. Metzler
CVPR, 2025

Accurate Eye Tracking from Dense 3D Surface Reconstructions using Single-Shot Deflectometry
Jiazhang Wang, **Tianfu Wang**, Bingjie Xu, Oliver Cossairt, Florian Willomitzer
Nature Communications, 2025

Repurposing Pre-trained Video Diffusion Models for Event-based Video Interpolation
Jingxi Chen, Brandon Y Feng, Haoming Cai, **Tianfu Wang**, Levi Burner, Dehao Yuan,
Cornelia Fermuller, Christopher A. Metzler, Yiannis Aloimonos
CVPR, 2025

Optimization-Based Eye Tracking using Deflectometric Information
Tianfu Wang, Jiazhang Wang, Oliver Cossairt, Florian Willomitzer
IEEE Transactions on Computational Imaging (TCI), 2024

DGInStyle: Domain Generalizable Semantic Segmentation with Image Diffusion Models and Stylized Semantic Control
Yuru Jia, Lukas Hoyer, Shengyu Huang, **Tianfu Wang**, Luc Van Gool, Konrad Schindler, Anton Obukhov
ECCV, 2024

Breathing New Life into 3D Assets with Generative Repainting
Tianfu Wang, Menelaos Kanakis, Konrad Schindler, Luc Van Gool, Anton Obukhov
British Machine Vision Conference (BMVC), 2023 (**Oral**)

A Mitsuba-based Study on Trade-offs Between Projection and Reflection Based Systems in Structured-Light 3D Imaging
Tianfu Wang, Florian Schiffers, Florian Willomitzer, Oliver Cossairt
Optica Computational Optical Sensing and Imaging, 2021

Talks

Breathing New Life into 3D Assets with Generative Repainting
British Machine Vision Conference (BMVC)
Aberdeen, United Kingdom, Nov. 2023

Optimization-Based Eye Tracking using Deflectometric Information
124th Annual Meeting of the German Branch of the European Optics Society (DGaO)
Berlin, Germany, May. 2023

A Mitsuba-based Study on Trade-offs Between
Projection and Reflection Based Systems in Structured-Light 3D Imaging
Optica Imaging and Applied Optics Congress
Washington, DC, United States, July. 2021

Scholarships

University of Maryland Graduate School Dean's Fellowship
$2500/yr fellowship for 2 years supporting graduate studies.
2024

Northwestern University Summer Undergraduate Research Grant Advanced (SURG Advanced)
$3500 research grant for Modeling and Analysis of Real Time 3D SPH Fluid Simulation on WebGL
Supervised by Prof. Jack Tumblin, 2020

Technical Skills

Languages/Libs: Python, C++, PyTorch, PyTorch3D, CUDA, OpenCV, Blender
Training/Infra: SLURM, torchrun/DistributedDataParallel, W&B
3D/Imaging: NeRF, 3D Gaussian Splatting, inverse problems, deflectometry, computational photography
Tools: Git, Linux, Bash **Languages:** Mandarin (native), English (proficient)