

YU YUAN

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RESEARCH INTERESTS

Visual Understanding and Generation, Physically-Consistent Image/Video Synthesis, World Models, Computational Photography, Diffusion Models, Generative Modeling, Image/Video Enhancement.

EDUCATION

Purdue University <i>PhD Student in Electrical and Computer Engineering</i> Advisor: Stanley H. Chan	West Lafayette, IN, US 08/2023 – 05/2027 (expected)
Shanghai Jiao Tong University <i>MS in Aeronautical and Astronautical Science and Technology</i>	Shanghai, China 09/2020 – 06/2023
Shanghai Jiao Tong University <i>BEng in Aeronautics and Astronautics Engineering</i> <i>Minor Degree in Administration Management</i>	Shanghai, China 09/2016 – 06/2020 10/2018 – 06/2020

PROJECTS EXPERIENCE

Purdue University <i>Research Assistant (Advisor: Prof. Stanley H. Chan)</i>	West Lafayette, IN 08/2023 – Present
<ul style="list-style-type: none">• SeeU (4D Understanding and Video Generation):<ul style="list-style-type: none">* Proposed SeeU, a framework that learns continuous 4D dynamics from 2D frames to “see the unseen”, enabling temporally unseen and spatially unseen generation as well as video editing.* Pioneered a 2D → 4D → 2D learning pipeline that lifts 2D inputs, models 4D dynamics, and projects back to produce coherent 2D results—introducing a new information flow and training scheme.• NewtonGen (Physics-Consistent Text-to-Video Generation):<ul style="list-style-type: none">* Developed a physics-consistent and controllable text-to-video framework that explicitly incorporates learnable dynamics.* Innovated Neural Newtonian Dynamics, which models different dynamics via unified neural ODEs.• Generative Photography (Scene-Consistent Camera-Controlled Text-to-Image Generation):<ul style="list-style-type: none">* Introduced a new text-to-image generation paradigm for photography with an understanding of camera physics.* Produced significantly more scene-consistent photorealistic images than SOTA models (Stable Diffusion 3, FLUX).• High Dynamic Range (HDR) Imaging:<ul style="list-style-type: none">* Proposed a novel high dynamic range (HDR) imaging framework capable of handling a flexible number of causal inputs.* Utilized side information and attention mechanisms to effectively suppress artifacts during the fusion process.	

PUBLICATIONS

Yu Yuan, Xijun Wang, Yichen Sheng, Prateek Chennuri, Xingguang Zhang, Stanley H. Chan.
Generative Photography: Scene-Consistent Camera Control for Realistic Text-to-Image Synthesis.
CVPR 2025 [Highlight & Demo]

Yu Yuan, Tharindu Wickremasinghe, Zeeshan Nadir, Xijun Wang, Yiheng Chi, Stanley H. Chan.
SeeU: Seeing the Unseen World via 4D Dynamics-aware Generation
arXiv 2025 [Under Review]

Yu Yuan, Xijun Wang, Tharindu Wickremasinghe, Zeeshan Nadir, Bole Ma, Stanley H. Chan.
NewtonGen: Physics-Consistent and Controllable Text-to-Video Generation via Neural Newtonian Dynamics.
arXiv 2025 [Under Review]

Yu Yuan, Yiheng Chi, Xingguang Zhang, Stanley H. Chan.

iHDR: Iterative HDR Imaging with Arbitrary Number of Exposures.

ICIP 2025

Xingguang Zhang, Nicholas Chimitt, Xijun Wang, **Yu Yuan**, Stanley H. Chan.

Learning Phase Distortion with Selective State Space Models for Video Turbulence Mitigation.

CVPR 2025 [Highlight]

Lanqing Guo*, Xijun Wang*, Minchul Kim*, **Yu Yuan**, Wes Robbins, Xingguang Zhang, Stanley H. Chan, Zhangyang Wang, Xiaoming Liu. ***Beyond Clean Pixels: Interdisciplinary Lessons from Turbulent Long-Range Face Recognition.***

2025 [Under Review]

Joonyeoup Kim, **Yu Yuan**, Xingguang Zhang, Xijun Wang, Stanley H. Chan.

Astrophotography Turbulence Mitigation via Generative Models.

ICIP 2025

Lindong Wang, Hongya Tuo, **Yu Yuan**, Henry Leung, Zhongliang Jing.

RCMixer: Radar-Camera Fusion Based on Vision Transformer for Robust Object Detection.

JVCI 2024

Yu Yuan, Jiaqi Wu, Lindong Wang, Zhongliang Jing, Henry Leung, Shuyuan Zhu, Han Pan.

Learning to Kindle the Starlight.

arXiv 2022

Yu Yuan, Jiaqi Wu, Zhongliang Jing, Henry Leung, Han Pan.

Multimodal Image Fusion based on Hybrid CNN-Transformer and Non-local Cross-modal Attention.

arXiv 2022

PATENT

A trajectory solving and alignment method based on inertial measurement unit and ultra-short baseline positioning sensors for autonomous underwater robots. China Patent. CN 114993313 B.

AWARDS & COMPETITIONS

Ivy League Scholarship for Exceptional Students (Innovation)	Top 1%
Outstanding Graduate of Shanghai Jiao Tong University	Top 15%
Shanghai International Creators Competition: Special Competition of Drones	First Prize
DELL AI for Social Innovation Competition: AI/ADAS of Intelligent Car	National Second Prize

OTHER ACTIVITIES

Teaching Assistant , Automatic Control Theory, Shanghai Jiao Tong University	2021
Workshop Organizer , WACV GAIP 2026	
Reviewer , CVPR, ICLR, CVPRW, ICCV, WACV, ICIP, ICASSP	
IEEE Graduate Student Member	

SKILLS

Languages: English (Fluent), Chinese (Native)

Programming: Python, PyTorch, HTML, JavaScript, Matlab, C/C++ (Basic)

Technologies: Diffusers, Transformers, Post-training, 3DGS, CUDA, OpenCV, NumPy, Git, LaTeX, Linux, Slurm, Markdown, Gradio, NVIDIA Jetson, Adobe Photoshop, Adobe Premiere

Others: Photography, Fishing, Drones, Rowing