Yao Yao

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ABOUT

I am a tenure-track associate professor at School of Intelligence Science and Technology, Nanjing University, where I establish and direct the 3D Vision Lab (NJU-3DV). Previously, I was a senior researcher at Apple, and a founding member of the startup company Altizure (acquired by Apple in 2020). I received my PhD degree from CSE, HKUST in 2019, supervised by Prof. Long Quan; and my bachelor degree from ECE, NJU in 2015, advised by Prof. Xun Cao.

My research interests lie in the intersection of computer vision and computer graphics, with a focus on **3D reconstruction**, **differentiable rendering**, and **3D content creation**. My representative works include the **MVSNet** series of works for multi-view reconstruction, the large-scale **BlendedMVS** dataset for geometry-related learning tasks, and the **NeILF** series of works for physically-based differentiable rendering. I have won the ICPR 2020 Best Student Paper Award (5 over 3250 submissions), and am a recipient of the Excellent Young Scholars Fund (Overseas) from NSFC.

Google scholar: https://scholar.google.com/citations?user=MGxaDVEAAAAJ

WORK EXPERIENCES

Associate Professor *June 2023 - now*
Nanjing University

- Founder and Director of Nanjing University 3D Vision Lab (NJU-3DV).
- Research focuses: 3D Reconstruction, differentiable rendering, 3D content creation.

Senior Researcher *April 2020 - May 2023*
Apple Inc.

- Lead researches on differentiable rendering and 3D content creation.
- Develop core algorithms for 3D computer vision.

Founding Member *July 2015 - April 2020*
Altizure.com (HKUST startup, **acquired by Apple**)

- Lead researches and prototype products related to 3D computer vision.
- Develop an accurate and robust MVS pipeline for large-scale 3D reconstruction.

EDUCATION

The Hong Kong University of Science and Technology *Sep. 2015 - Dec. 2019*
PhD in Computer Science and Engineering
Thesis: Learning Large-Scale Multi-View Stereopsis
Supervisor: Prof. Long Quan

Nanjing University *Sep. 2011 - July 2015*
BSc in Electronic Information Science and Technology
Undergraduate Thesis: Research on Multi-view Stereo
Advisor: Prof. Xun Cao

PUBLICATIONS

*Corresponding author

1. Jingyang Zhang, Shiwei Li, Yuanxun Lu, Tian Fang, David McKinnon, Yanghai Tsin, Long Quan, **Yao Yao***. JointNet: Extending Text-to-Image Diffusion for Dense Distribution Modeling. **arXiv** preprint 2023.

2. Jingyang Zhang, **Yao Yao***, Shiwei Li, Jingbo Liu, Tian Fang, David McKinnon, Yanghai Tsin, Long Quan. NeILF++: Inter-Reflectable Light Fields for Geometry and Material Estimation. **ICCV** 2023.

3. Jingyang Zhang, Shiwei Li, Zixin Luo, Tian Fang, **Yao Yao***. Vis-MVSNet: Visibility-aware Multi-view Stereo Network. **IJCV** 2022.

4. **Yao Yao**, Jingyang Zhang, Jingbo Liu, Yihang Qu, Tian Fang, David McKinnon, Yanghai Tsin, Long Quan. NeILF: Neural Incident Light Field for Physically-based Material Estimation. **ECCV** 2022.

5. Jingyang Zhang, **Yao Yao***, Shiwei Li, Tian Fang, David McKinnon, Yanghai Tsin, Long Quan. Critical Regularizations for Neural Surface Reconstruction in the Wild. **CVPR** 2022.

6. Jingyang Zhang, **Yao Yao***, Long Quan. Learning Signed Distance Field for Multi-view Surface Reconstruction. **ICCV** 2021. (**Oral**)

7. Jingyang Zhang, **Yao Yao***, Shiwei Li, Zixin Luo, Tian Fang. Visibility-aware Multi-view Stereo Network. **BMVC** 2020. (**Oral**)

8. Jingyang Zhang, **Yao Yao***, Zixin Luo, Shiwei Li, Tianwei Shen, Tian Fang, Long Quan. Learning Stereo Matchability in Disparity Regression Networks. **ICPR** 2020. (**Best Student Paper Award**)

9. **Yao Yao**, Zixin Luo, Shiwei Li, Jingyang Zhang, Yufan Ren, Lei Zhou, Tian Fang, Long Quan. BlendedMVS: A Large-scale Dataset for Generalized Multi-view Stereo Networks. **CVPR** 2020. (**>200 citations**)

10. **Yao Yao**, Zixin Luo, Shiwei Li, Tianwei Shen, Tian Fang, Long Quan. Recurrent MVSNet for High-resolution Multi-view Stereo Depth Inference. **CVPR** 2019. (**>400 citations**)

11. **Yao Yao**, Zixin Luo, Shiwei Li, Tian Fang, Long Quan. MVSNet: Depth Inference for Unstructured Multi-view Stereo. **ECCV** 2018. (**Oral, >800 citations**)

12. **Yao Yao**, Shiwei Li, Siyu Zhu, Hanyu Deng, Tian Fang, Long Quan. Relative Camera Refinement for Accurate Dense Reconstruction. **3DV** 2017.

13. **Yao Yao**, Hao Zhu, Yongming Nie, Xiaoli Ji, Xun Cao. Revised depth map estimation for multi-view stereo. **IC3D** 2014.

14. Yifei Zeng, Yuanxun Lu, Xinya Ji, **Yao Yao**, Hao Zhu, Xun Cao. AvatarBooth: High-Quality and Customizable 3D Human Avatar Generation. **arXiv** preprint 2023.

15. Yiyu Zhuang, Qi Zhang, Ying Feng, Hao Zhu, **Yao Yao**, Xiaoyu Li, Yan-Pei Cao, Ying Shan, Xun Cao. Anti-Aliased Neural Implicit Surfaces with Encoding Level of Detail. **Siggraph Asia** 2023.

16. Zixin Luo, Lei Zhou, Xuyang Bai, Hongkai Chen, Jiahui Zhang, **Yao Yao**, Shiwei Li, Tian Fang, Long Quan. ASLFeat: Learning Local Features of Accurate Shape and Localization. **CVPR** 2020. (**>200 citations**)

17. Lei Zhou, Zixin Luo, Tianwei Shen, Jiahui Zhang, Mingmin Zhen, **Yao Yao**, Tian Fang, Long Quan. Learning Temporal Camera Relocalization using Kalman Filtering. **CVPR** 2020. (**Oral**)

18. Tianwei Shen, Zixin Luo, Lei Zhou, **Yao Yao**, Shiwei Li, Jiahui Zhang, Tian Fang, Long Quan. Self-Supervised Learning of Depth and Motion Under Photometric Inconsistency. **ICCVW** 2019.

19. Zixin Luo, Tianwei Shen, Lei Zhou, Jiahui Zhang, **Yao Yao**, Shiwei Li, Tian Fang, Long Quan. Local Feature Augmentation with Cross-Modality Context. **CVPR** 2019. (**Oral, >200 citations**)

20. Shiwei Li, Zixin Luo, Mingmin Zhen, **Yao Yao**, Tianwei Shen, Tian Fang, Long Quan. Cross-atlas Convolution for Parameterization Invariant Learning on Textured Mesh Surface. **CVPR** 2019.

21. Zixin Luo, Tianwei Shen, Lei Zhou, Siyu Zhu, Runze Zhang, **Yao Yao**, Tian Fang, Long Quan. GeoDesc: Learning Local Descriptors by Integrating Geometry Constraints. **ECCV** 2018.

22. Shiwei Li, **Yao Yao**, Tian Fang, Long Quan. Reconstructing Thin Structures of Manifold Surfaces by Integrating Spatial Curves. **CVPR** 2018.

TEACHING

Teaching

NJU IST Pattern Recognition	*Fall 2023*

Teaching Assistant

HKUST COMP5421 Computer Vision	*Spring 2019*
HKUST COMP2011 Introduction to Object-oriented Programming	*Fall 2017*
HKUST COMP5421 Computer Vision	*Spring 2017*
HKUST COMP2012 Object-Oriented Programming and Data Structures	*Fall 2016*
HKUST COMP2011 Introduction to Object-oriented Programming	*Spring 2016*

PROFESSIONAL SERVICES

Conference Reviewer	CVPR, ICCV, Neurips	*2023*
	CVPR, Siggraph, ICRA, ECCV	*2022*
	CVPR, ICLR	*2021*
	CVPR, ECCV, Siggraph Asia, AAAI, BMVC	*2020*
	CVPR, ICCV	*2019*
Journal Reviewer	TPAMI, TOG, ISPRS	*2023*
	TPAMI, TOG, TCSVT	*2022*
	TPAMI, TVCG, TOG	*2021*
	TPAMI, IJCV, TIP, ISPRS	*2020*
	IJCV, ISPRS	*2019*
	IJCV	*2015*

AWARDS

Honors	ICPR 2020 Best Student Paper Award (0.15%)	*2020*
	Outstanding Undergraduate Thesis in NJU (2%)	*2015*
	Outstanding Student in Jiangsu Province (0.5%)	*2014*
	Outstanding Student in Nanjing University (5%)	*2014*
Scholarships	HKUST Postgraduate Studentship	*2015 - 2018*
	People's Scholarship	*2013*
	National Scholarship (2%)	*2012*

FOUNDINGS

Nanjing University	Zijin Scholar Fund	*2023*
Nanjing University	Startup Fund	*2023*
NSF of China	Excellent Young Scholars Fund (Overseas)	*2022*