

PERSONAL INFO

I'm a researcher at Bytedance, my current work is GenAI and 3D vision.

RESEARCH INTERESTS

Image/Video/3D GenAI, 3D Scene Understanding, Crowd Analysis (Counting, Localization and Motion), Video Understanding, Action Recognition, Semantic Segmentation, Domain Adaptation, Learning with Less Supervision

EDUCATION

École Polytechnique Fédérale de Lausanne (EPFL)

Ph.D. in Computer Science

Title of Thesis: Human-Centered Scene Understanding via Crowd Counting

Advisor: Prof. Pascal Fua

Research Group: Computer Vision Laboratory

Lausanne, Switzerland

Sept. 2017 – Nov. 2021

University of California, Los Angeles (UCLA)

Visiting Scholar

Advisor: Prof. Stefano Soatto

Research Group: UCLA Vision Lab

Los Angeles, US

Sept. 2016 – Mar. 2017

École Polytechnique Fédérale de Lausanne (EPFL)

M.Sc. in Communication Systems

Title of Thesis: Active Perception Using Recurrent Neural Networks

Advisor: Prof. Stefano Soatto and Prof. Pascal Fua

Lausanne, Switzerland

Sept. 2014 – Apr. 2017

University of Electronic Science and Technology of China (UESTC)

B.Eng in Electronic and Information Engineering

Title of Thesis: Video Compressing With H.264

Advisor: Prof. Feng Fan

Chengdu, China

Sept. 2010 – July 2014

WORK EXPERIENCE

Bytedance

Researcher

Project: GenAI and 3D vision

Shanghai, China

Feb. 2025 – Present

Tencent

Senior Research Scientist, TechLead

Project: 3D AIGC with Different Input Modalities

Shanghai, China

Feb. 2022 – Present

École Polytechnique Fédérale de Lausanne (EPFL)

Graduate Student Researcher

Project: Human-Centered Scene Understanding via Crowd Counting

Advisor: Prof. Pascal Fua

Lausanne, Switzerland

June 2017 – Jan. 2022

Microsoft

Research Intern

Project: Video Alignment for Action Recognition in Mixed Reality Environment

Mentor: Dr. Bugra Tekin and Prof. Marc Pollefeys

Zurich, Switzerland

Apr. 2021 – June 2021

Amazon

Research Intern

Project: Domain Adaptation for Semantic Segmentation

Mentor: Dr. Christian Leistner

Graz, Austria

July 2020 – Oct. 2020

NVISO

Computer Vision Engineer Intern

Project: Lightweight Caffe Framework for Mobile Devices

Lausanne, Switzerland

Feb. 2016 – Aug. 2016

PUBLICATIONS

- [1] R. Cui, X. Song, W. Sun, S. Wang, **W. Liu**, S. Chen, T. Shang, Y. Li, N. Barnes, H. Li and P. Ji. LAM3D: Large Image-Point-Cloud Alignment Model for 3D Reconstruction from Single Image. *Neural Information Processing Systems* (NeurIPS), 2024.
- [2] H. Yan, Y. Li, Z. Wu, S. Chen, W. Sun, T. Shang, **W. Liu**, T. Chen, X. Dai, C. Ma, H. Li and P. Ji. Frankenstein: Generating Semantic-Compositional 3D Scenes in One Tri-Plane. *SIGGRAPH Asia*, 2024.
- [3] R. Cui, **W. Liu**[†], W. Sun, S. Wang, T. Shang, Y. Li, X. Song, H. Yan, Z. Wu, S. Chen, H. Li and P. Ji. Neusdfusion: A Spatial-Aware Generative Model for 3D Shape Completion, Reconstruction, and Generation. *The European Conference on Computer Vision* (ECCV), 2024.
- [4] Z. Wu, Y. Li, H. Yan, T. Shang, W. Sun, S. Wang, R. Cui, **W. Liu**, H. Sato, H. Li and P. Ji. BlockFusion: Expandable 3D Scene Generation using Latent Tri-plane Extrapolation. *ACM Transactions on Graphics* (SIGGRAPH), 2024.
- [5] J. Wei, X. Song, **W. Liu**, L. Kneip, H. Li and P. Ji. RGB-based Category-level Object Pose Estimation via Decoupled Metric Scale Recovery. *IEEE International Conference on Robotics and Automation* (ICRA), 2023.
- [6] M. Engilberge, **W. Liu** and P. Fua. Multi-view Tracking Using Weakly Supervised Human Motion Prediction. *IEEE/CVF Winter Conference on Applications of Computer Vision* (WACV), 2023.
- [7] **W. Liu**, B. Tekin, H. Coskun, V. Vineet, P. Fua and M. Pollefeys. Learning to Align Sequential Actions in the Wild. *The IEEE Conference on Computer Vision and Pattern Recognition* (CVPR), 2022.
- [8] **W. Liu**, N. Durasov and P. Fua. Leveraging Self-Supervision for Cross-Domain Crowd Counting. *The IEEE Conference on Computer Vision and Pattern Recognition* (CVPR), 2022 (**Oral**).
- [9] **W. Liu**, M. Salzmann and P. Fua. Counting People by Estimating People Flows. *IEEE Transactions on Pattern Analysis and Machine Intelligence* (TPAMI), 2021.
- [10] **W. Liu**, M. Salzmann and P. Fua. Estimating People Flows to Better Count Them in Crowded Scenes. *The European Conference on Computer Vision* (ECCV), 2020.
- [11] **W. Liu**, K. Lis, M. Salzmann and P. Fua. Geometric and Physical Constraints for Drone-Based Head Plane Crowd Density Estimation. *The IEEE/RSJ International Conference on Intelligent Robots and Systems* (IROS), 2019.
- [12] **W. Liu**, M. Salzmann and P. Fua. Context-Aware Crowd Counting. *The IEEE Conference on Computer Vision and Pattern Recognition* (CVPR), 2019.

PROFESSIONAL SERVICES

- Reviewer of major computer vision and machine learning conferences (*CVPR*, *ICCV*, *ECCV*, *ICML*, *ICLR*, *NeurIPS*) and journals (*T-PAMI*, *IJCV*, *TIP*)
- Outstanding reviewer of *ECCV* 2022.

RELEVANT SKILLS

Programming Language: Python, C++, MATLAB

Software Framework: PyTorch, OpenCV, TensorFlow, SNPE, Caffe

Others: Unreal Engine