

Yao Wei

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SUMMARY

I am a Ph.D. student at Faculty of Geo-Information Science and Earth Observation (ITC) at University of Twente, The Netherlands, supervised by Prof. George Vosselman and Prof. Michael Ying Yang. My research interests include multi-modal learning, generative models and scene understanding.

PUBLICATIONS

- [1] **Yao Wei**, Matteo Toso, Pietro Morerio, Michael Ying Yang, Alessio Del Bue. **Functional 3D Scene Synthesis through Human-Scene Optimization**. (*Under Review*), 2025.
- [2] **Yao Wei**, Martin Renqiang Min, George Vosselman, Li Erran Li, Michael Ying Yang. **Planner3D: LLM-enhanced graph prior meets 3D indoor scene explicit regularization**. *IEEE Transactions on Pattern Analysis and Machine Intelligence* (*Under Review*), 2024.
- [3] **Yao Wei**, George Vosselman, Michael Ying Yang. **BuilDiff: 3D building shape generation using single-image conditional point cloud diffusion models**. *IEEE/CVF International Conference on Computer Vision Workshops*, 2023.
- [4] **Yao Wei**, George Vosselman, Michael Ying Yang. **Flow-based GAN for 3D point cloud generation from a single image**. *British Machine Vision Conference*, 2022.
- [5] **Yao Wei**, Shunping Ji. **Scribble-based weakly supervised deep learning for road surface extraction from remote sensing images**. *IEEE Transactions on Geoscience and Remote Sensing*, 2021, 60: 1-12.
- [6] **Yao Wei**, Kai Zhang, Shunping Ji. **Simultaneous road surface and centerline extraction from large-scale remote sensing images using CNN-based segmentation and tracing**. *IEEE Transactions on Geoscience and Remote Sensing*, 2020, 58(12): 8919-8931.

RESEARCH EXPERIENCE

Amazon AWS AI

Applied Scientist Intern

Santa Clara, USA

12/2024-Present

Manager: Dr. Qin Zhang

- **Vision-language modeling**

- Develop VLM for referring and reasoning video object segmentation. (In progress)

Istituto Italiano di Tecnologia

Visiting Scientist

Genoa, Italy

6/2024-11/2024

Principal Investigator: Dr. Alessio Del Bue

- **Human-aware indoor scene synthesis**

- Improve generative pipelines for functional 3D scene synthesis through distilling human-scene interaction priors. (cf. Publication [1])

University of Twente

Ph.D. Candidate

Enschede, The Netherlands

9/2021-Present

Supervisor: Prof. George Vosselman, Prof. Michael Ying Yang

- **3D scene understanding**

- Propose methods for scene-level 3D multi-object synthesis. (cf. Publication [2])
- Propose methods for object-level 3D shape synthesis. (cf. Publication [3] [4])

- **Generative models**

- Develop a conditional diffusion-based pipeline for generating 3D point clouds of buildings from single general-view images. (cf. Publication [3])
- Develop a Normalizing Flow-based GAN for point cloud reconstruction that can generate an arbitrary number of points while maintaining detailed 3D structure. (cf. Publication [4])

- **Multi-modal learning**

- Compositional 3D scene generation from scene graph. (cf. Publication [2])
- 3D point cloud generation from single-view image. (cf. Publication [3] [4])

Wuhan University

Master Student

Supervisor: Prof. Shunping Ji

Wuhan, China

9/2018-6/2021

- **Road extraction from remote sensing images using deep learning techniques**

- Present a weakly supervised learning approach for road surface extraction from remote sensing images under the weak supervision of centerline-like scribble annotations. (cf. Publication [5])
- Present a multi-stage framework for simultaneous road surface segmentation and centerline tracing, advancing the automation and road extraction accuracy, especially in terms of road connectivity and completeness. (cf. Publication [6])

EDUCATION

University of Twente

Ph.D. in Computer Science

Enschede, The Netherlands

9/2021-7/2025(*expected*)

Wuhan University

M.S. in Photogrammetry and Remote Sensing

Wuhan, China

9/2018-6/2021

China University of Petroleum

B.S. in Geographic Information Science

Qingdao, China

9/2014-6/2018

PROGRAM COMMITTEES

Member, British Machine Vision Association.

Student Member, IEEE.

Conference Reviewer, ICLR; AAAI; NeurIPS; CVPR; ICCV; ECCV; BMVC; etc.

Journal Reviewer, ISPRS Journal of Photogrammetry and Remote Sensing; IEEE Sensors Journal; Geo-spatial Information Science; International Journal of Digital Earth; etc.

SKILLS

Professional experience: Machine Learning, Computer Vision, Remote Sensing

Programming: Python, Matlab, C/C++

Library: PyTorch, OpenCV, NumPy, Keras, Tensorflow

Software: ArcGIS, CloudCompare

Language: Chinese (native), English (fluent)

Other: Linux, Windows, Git, Microsoft Office, LaTeX