# 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** — Santa Clara, USA
*Applied Scientist Intern* — *12/2024-4/2025*
Manager: Dr. Qin Goldstein

- **Vision-language modeling**
  - Develop VLM for referring video object segmentation.

**Istituto Italiano di Tecnologia** — Genoa, Italy
*Visiting Scientist* — *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** — Enschede, The Netherlands
*Ph.D. Candidate* — *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** Wuhan, China
*Master Student* *9/2018-6/2021*
Supervisor: Prof. Shunping Ji

- **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** Enschede, The Netherlands
*Ph.D. in Computer Science* *9/2021-9/2025(expected)*

**Wuhan University** Wuhan, China
*M.S. in Photogrammetry and Remote Sensing* *9/2018-6/2021*

**China University of Petroleum** Qingdao, China
*B.S. in Geographic Information Science* *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