

PROFESSIONAL EXPERIENCE

Technical University of Munich

Senior Researcher at Photogrammetry & Remote Sensing Chair

Munich, Germany

Sep 2023–Present

- Leading an interdisciplinary team of researchers at the intersection of GIS, photogrammetry, computer vision, and machine learning research
- Designing new 3D reconstruction scientific projects and acquiring project funds with internal and external partners
- Enabling young researchers creating innovative 3D reconstruction solutions both individually and as a team leading to scientific publications
- Initiating and leading the tum2twin project focusing on the development of the novel benchmark dataset for the state-the-art 3D urban reconstruction (AEC/GIS)

Researcher in a R&D project (HD maps)

Sep 2020–Sep 2023

- Collaborating with automotive domain experts on solving their real-world problems and translating them into research challenges
- Designing and developing 3D building reconstruction strategy enabling up to 20% increase of reconstruction accuracy by leveraging machine learning solutions
- Initiating and managing first-of-its-kind open repositories of urban 3D training benchmark datasets
- Creating synthetic and real data for generating virtual test-beds comprising GIS city models and HD maps in game engines
- Publishing and presenting results to scientific and non-scientific audience achieving 80% higher research interest than related academics

SHH

GIS Specialist

Wroclaw, Poland

Sep 2017–Jul 2018

- Designing a GIS system comprising semantic 3D city models awarded as the most innovative solution of 2019 in Poland
- Implementing the TOP 4 worldwide GIS semantic 3D city model map system
- Developing an innovative workflow of converting high-definition CAD assets and point clouds to high-detail map models
- Conducting tutorials for clients concerning CAD modelling, point clouds and image processing, camera-based 3D reconstruction, map creation for AEC domains

INTERNSHIPS

Audi AG

Master's Thesis Candidate

Ingolstadt, Germany

Mar 2020–Sep 2020

- Thesis: “Semantic-based Geometry Refinement of 3D City Models for Testing Automated Driving”
- Developing a pipeline fusing HD maps and mobile mapping point clouds to maximize their advantages for testing automated and autonomous driving

Audi AG

Intern

Ingolstadt, Germany

Aug 2019–Sep 2019

- Sharpening a workflow generating semantic city and street space virtual models for autonomous driving simulations

Technical University of Munich

Student Research Assistant

Munich, Germany

Dec 2018–Mar 2020

- Implementing 3D modeling approaches to create virtual environments in a game engine for autonomous driving simulations
- Creating a workflow generating semantic cross-country 3D map models

EDUCATION

Technical University of Munich

PhD in Photogrammetry & Remote Sensing

Munich, Germany

Sep 2020–May 2024

- Thesis: Enrichment of 3D building models by facade elements based on point clouds and confidence values

Technical University of Munich

M.Sc. in Geodesy & Geoinformation

Munich, Germany

Oct 2018–Sep 2020

- Major: GIS, Cartography, Photogrammetry, Remote Sensing

Technical University of Crete

A semester within the Erasmus+ Programme

Chania, Greece

Oct 2016–Jan 2017

- Major: Photogrammetry

Wroclaw University of Science and Technology

B.Eng. in Geodesy and Cartography

Wroclaw, Poland

Oct 2015–Feb 2018

- Major: Geodesy, Cartography, GIS

SELECTED PROJECTS

tum2twin [\[Link\]](#)

Initiator and leader

Munich, Germany

Oct 2023–Present

- Initiating and leading an open source project creating an urban 3D digital twin of city district serving as the state-of-the-art 3D urban reconstruction (AEC/GIS)

Awesome CityGML [\[Link\]](#)

Designer and maintainer

Munich, Germany

Jan 2021–Present

- Initiating and managing an open source project aiming to collect all available open data 3D city models and related software

TUM-FAÇADE [\[Link\]](#)

Designer and maintainer

Munich, Germany

Dec 2021–Nov 2022

- Managing and designing a team project delivering an open and novel point cloud facade segmentation benchmark focused on AEC automation

TUM Hyperloop [\[Link\]](#)

GIS Specialist

Munich, Germany

Nov 2019–Apr 2020

- Working in a multi-disciplinary team contributing to the path planning of the TUM Hyperloop pod in a GIS system

SKILLS

- **Designing** machine learning and deterministic point cloud 3D reconstruction algorithms adhering to 3D mapping standards (CityGML, OpenDRIVE)
- **Developing** solutions in Python (Open3D, NumPy, Pandas, OpenCV, PyTorch, TensorFlow), Unreal Engine (CARLA, AirSim), FME, and QGIS
- **Communicating** effectively findings in written and verbal forms to academic and industry partners
- **Leading** teams of professionals and academics to pursue a common goal

LANGUAGES

- **English:** Full professional proficiency
- **German:** Professional working proficiency
- **Polish** Native proficiency

CERTIFICATES

- FME Certified Professional Certificate Apr 2021
- MicroStation Everything 3D V8i | fr | Base Release Apr 2018

SCHOLARSHIPS AND AWARDS

- Runner-up: Best poster presentation, the 3D GeoInfo 2022 conference, Sydney, Australia Oct 2022
- Deutscher Akademischer Austauschdienst (DAAD) Study Scholarships for Graduates Aug 2018
- 1st place: Best oral paper presentation, the 15th Students' Science Conference, Jelenia Gora, Poland Sep 2017
- Rector's Scholarship: For outstanding high-grade average and achievements in the scientific area Sep 2017

VOLUNTARY ACTIVITIES

- Doctoral Candidate Representative Oct 2021–Sep 2022
Representing approximately 2000 doctoral candidates
- Ged Kids into Survey Mar 2021–Present
Disseminating knowledge about surveying and map creation to younger generations
- Runder Tisch GIS e.V. Oct 2019–Present
Analyzing and publishing about trends at the INTERGEO

SELECTED PUBLICATIONS [[FULL LIST LINK](#)]

- **Wysocki, O.**, Tan, Y., Froech, T., Hoegner, L., and Holst, Ch. FacadeNet: Point cloud benchmark dataset for 3D facade semantic segmentation, *Submitted for Proceedings of the European Conference on Computer Vision (ECCV) 2024*
- Bieringer A., **Wysocki, O.**, Hoegner L., Holst, Ch. Analyzing the impact of semantic LoD3 building models on image-based vehicle localization, *Under review for 3DGeoInfo 2024*
- Froech, T., **Wysocki, O.**, Xia, Y., Xie, J., Schwab, B., Kolbe, TH., Cremers D. FacaDiffy: Inpainting unseen facade parts using diffusion models, *Under review for International Joint Conference on Artificial Intelligence (IJCAI) 2024*
- **Wysocki, O.**, Xia, Y., Wysocki M., Grilli, E., Hoegner, L., Cremers D., and Stilla, U. Scan2LoD3: Reconstructing semantic 3D building models at LoD3 using ray casting and Bayesian networks, *In: Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 6547-6557, 2023, <https://shorturl.at/qzSX0>*
- Froech, T., **Wysocki, O.**, Hoegner, L., Stilla, U. Reconstructing facade details using MLS point clouds and Bag-of-Words approach *In: International 3D GeoInfo Conference 2023, Recent Advances in 3D Geoinformation Science, 337-355. Cham: Springer Nature Switzerland, 2023, https://doi.org/10.1007/978-3-031-43699-4_21*

- Tan, Y., **Wysocki, O.**, Hoegner, L., Stilla, U. Classifying point clouds at the facade-level using geometric features and deep learning networks, *In: International 3D GeoInfo Conference 2023, Recent Advances in 3D Geoinformation Science*, 391-404. Cham: Springer Nature Switzerland, 2023, <https://doi.org/10.1007/978-3-031-43699-425>
- Schwarz, S., Pilz, T., **Wysocki, O.**, Hoegner, L., Stilla, U. Transferring facade labels between point clouds with semantic octrees while considering change detection *In: International 3D GeoInfo Conference 2023, Recent Advances in 3D Geoinformation Science*, 287-298. Cham: Springer Nature Switzerland, 2023, <https://doi.org/10.1007/978-3-031-43699-417>
- **Wysocki, O.**, Hoegner, L., Stilla, U. MLS2LoD3: Refining low LoDs building models with MLS point clouds to reconstruct semantic LoD3 building models. *In: International 3D GeoInfo Conference 2023, Recent Advances in 3D Geoinformation Science*, 367-380. Cham: Springer Nature Switzerland, 2023, <https://doi.org/10.1007/978-3-031-43699-423>
- **Wysocki, O.**, Grilli, E., Hoegner, L. and Stilla, U. Combining visibility analysis and deep learning for refinement of semantic 3D building models by conflict classification, *ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, X-4/W2-2022, 289-296, <https://doi.org/10.5194/isprs-annals-X-4-W2-2022-289-2022>, 2022
- **Wysocki, O.**, Hoegner, L. and Stilla, U. Refinement of semantic 3D building models by reconstructing underpasses from MLS point clouds, *International Journal of Applied Earth Observation and Geoinformation*, 111, 2022, 102841, <https://doi.org/10.1016/j.jag.2022.102841>, 2022
- **Wysocki, O.**, Hoegner, L. and Stilla, U. TUM-FAÇADE: Reviewing and enriching point cloud benchmarks for façade segmentation, *International Archives of the Photogrammetry, Remote Sensing Spatial Information Sciences*, XLVI-2/W1-2022, 529-536, <https://doi.org/10.5194/isprs-archives-XLVI-2-W1-2022-529-2022>, 2022
- **Wysocki, O.**, Xu, Y. and Stilla, U. Unlocking point cloud potential: Fusing MLS point clouds with semantic 3D building models while considering uncertainty, *ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, VIII-4/W2-2021, 45-52, <https://doi.org/10.5194/isprs-annals-VIII-4-W2-2021-45-2021>, 2021
- **Wysocki, O.**, Schwab, B., Hoegner, L., Kolbe, TH. and Stilla, U. Plastic surgery for 3D city models: A pipeline for automatic geometry refinement and semantic enrichment, *ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, V-4-2021, 17-24, <https://doi.org/10.5194/isprs-annals-V-4-2021-17-2021>, 2021