Professorship of Remote Sensing Applications
TUM School of Engineering and Design
Technische Universität München

Master Thesis

Multitemporal UAV photogrammetry for constraining the lateral sediment transport of the Isar

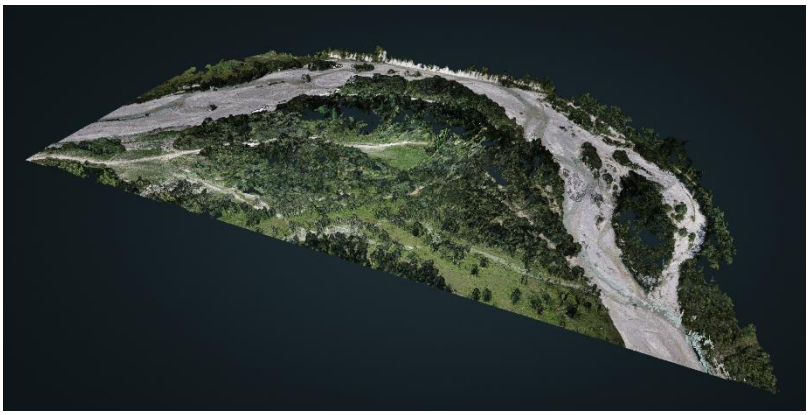

Figure 1. Photogrammetric point cloud of the Isar river acquired in August 2024. Check out the 3D viewer here: http://129.187.153.225/scenes/Isar_Riverbank.html

Rivers are important corridors for the transport of water, sediment, and nutrients. They also shape the landscape by cutting valleys into uplifting rock, shifting sediment back and forth across wide channel belts, and slowly filling sedimentary basins. Recent models and experimental data suggest that the “lateral transport capacity”, the capacity of the river to move sediment back and forth across a channel belt, controls channel migration rates as well as the width of river valleys. However, the controls on that lateral transport capacity are poorly understood.

The objective of this thesis is to measure lateral sediment transport and channel migration of the Isar near Wallgau across a range of discharges with repeat UAV surveys. Photogrammetric reconstruction of UAV imagery will provide data of the 3D surface for geomorphometric analysis and topographic change detection. The new data will yield critical constraints on how discharge sets river mobility and valley geometries.

The student requires experience with photogrammetric data processing and point cloud analysis and basic programming skills (preferrably Python). Participation in field work is optional.

Location: TUM Professorship of Remote Sensing Applications

Supervision: Prof. Dr. Katharina Anders (TUM), Prof. Dr. Aaron Bufe (LMU)

Collaborators: Jens Turowski (German Research Centre of Geosciences), Regional Water Management Office of Weilheim

Contact: k.anders@tum.de