Professorship Big Geospatial Management
TUM School of Engineering and Design
Technichal University of München

Bachelor's or Master's Thesis

Investigate and Evaluate Cloud Services for Point Cloud Data Management and Analysis

Are you looking for a Bachelor's or Master's thesis in cloud computing? Are you interested in cloud infrastructure services and technologies? Do you want to get experience in the emerging field of cloud native geospatial data management?

We look forward to you joining us as a Bachelor's or Master's Thesis student (d/f/m) within the Big Geospatial Data Management Group at the Department for Aerospace and Geodesy, TUM School of Engineering and Design. A Supervision in the School of Computation, Information and Technology is also possible.

Location: Ottobrunn/Munich/Remote

Duration: 3 to 6 months, depending on your study program

Your topic:
Cloud computing is increasingly used to manage and analyze data at scale. Emerging trends in this regard are data management approaches that disaggregate storage and compute, especially combining cheap blob storage with columnar file formats for advanced analytics. Whether such an architecture can serve as a backend for large-scale point cloud analysis and interactive visualization, towards the goal of a cloud-based mixed reality platform, needs further investigation and evaluation.

This may include:

- Comparing and evaluating columnar formats for the storage and management of point cloud data.
- Investigating and assessing approaches for efficient ingestion and retrieval.
- Benchmarking the developed approaches in comparison with traditional point cloud data management solutions.

Related Work:

- Teuscher, B., & Werner, M. (2025). Point Cloud Data Management for Analytics in a Lakehouse. *AGILE: GIScience Series*, *6*.
- Armbrust, M., Ghodsi, A., Xin, R., & Zaharia, M. (2021). Lakehouse: A New Generation of Open Platforms that Unify Data Warehousing and Advanced Analytics. *11th Annual Conference on Innovative Data Systems Research (CIDR ’21).*

Qualifications:

- Interest in the emerging field of Big (Geospatial) Data
- Advanced programming skills (Python, Rust)
- Experience with Cloud-based Data Management
- Interest and experience in literature-based work with good scientific practice
- Enrolled full-time student in Computer Science, Electrical Engineering, Geo Informatics, or similar
- Fluent English language skills are mandatory

Applications via Mail with CV and transcript to:

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