

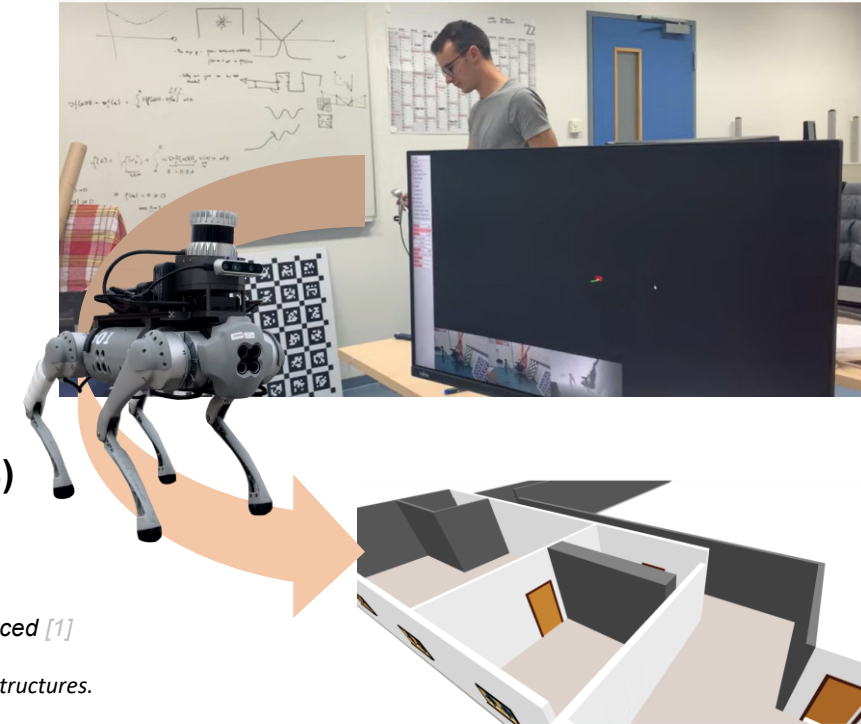
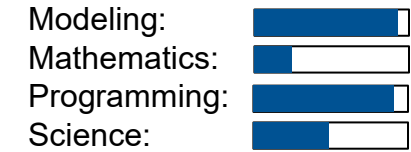
# Real-Time Building Digital Model Reconstruction Using a Robotic Agent

*The project aims to capture real-time spatial data of the built environment using advanced sensors, including LiDAR and an RGB-D camera, mounted on a robotic system. The process includes leveraging the Robot Operating System (ROS) to stream sensor data to algorithms for real-time processing and geometric reconstruction.*

## Task

1. Getting familiar with a robotic simulation environment and the available robotic setup
2. Capturing real-time data using sensor setup (Lidar and RGB-D camera)
3. Streaming real time captured data to geometry reconstruction algorithm
4. Data processing and geometry reconstruction
5. Testing and Optimization (Using a case study representative of the TUM main campus)
6. Experimental test with real robot and sensor setup

## Project Characteristics



[1] Franz, Steffen & Imler, Robert & Rüppel, Uwe. (2018). Real-time collaborative reconstruction of digital building models with mobile devices. *Advanced Engineering Informatics*. 38. 569-580. [10.1016/j.aei.2018.08.012](https://doi.org/10.1016/j.aei.2018.08.012). <https://doi.org/10.1016/j.aei.2018.08.012>

[2] Mehranfar, M.; Braun, A.; Borrmann, A.: From dense point clouds to semantic digital models: End-to-end AI-based automation procedure for Manhattan-world structures. *Automation in Construction* 162, 2024, 105392. [doi:https://doi.org/10.1016/j.autcon.2024.105392](https://doi.org/10.1016/j.autcon.2024.105392)