

Master's Project (MP, 5 ECTS)



FMT

On-site Digitalizing Rock Blocks

Description

Recent developments allow the on-site digitalization of rock blocks by means of computer vision. Most commonly, a series of digital images are taken from various directions of the object and a 3D-point cloud can be generated by "structure from motion".

This information can afterwards be used e.g. for advanced rock fall simulations such as RAMMS::ROCKFALL (WSL, Eidg. Forschungsanstalt für Wald, Schnee und Landschaft), which also take the actual shape of the rock boulder taken into account.

Another field of application is the back calculation of the insitu block size distribution of a blocky rock mass, where such 3D models deliver valuable information about the block shape and volume (if the model is scaled).

However, the applicability of such SfM-tools is often limited to the prominence and visual discriminability of the investigated rock block (referred to the back ground) as well as the scaling of the 3D model.

This project focusses on the evaluation of state of the art methods to digitize rock blocks on-site and shall treat the following questions:

- How can rock blocks be digitized on-site?
- What programmes are available for this task?
- What are the drawbacks and advantages of the single programmes?

Methodology:

- Preparation of a work plan and a task schedule with mile stones
- Literature research on digitizing objects with close-range photogrammetry
- Evaluation of the different possibilities of digitizing programmes
- Development of a applicable concept to digitize rock boulders on-site
- Writing a technical report with the results

Templates for the scientific report can be found on the institute's homepage. There is also a guideline for scientific writing free downloadable at the homepage, whose compliance is mandatory. The language for the report can either be in English or in German.

Supervisor

Andreas Buyer, MSc.
Graz University of Technology
Institute of Rock Mechanics and Tunnelling

Start

by arrangement

Duration

ca. 125 h

Contact

MSc Andreas Buyer
Tel.: +43 (0) 316 / 873 8615
E-Mail: a.buyer[at]tugraz.at