

# **Topographic mapping of rock formations using GIS methods**

## **Abstract**

This thesis deals with issues of creating 3D models of rock formations with data from terrestrial laser scanning, close range photogrammetry and UAV photogrammetry. The theoretical part focuses on explaining functioning and usage of those methods. Beside that there is described issues of 3D point cloud filtering. Practical part of this work describes data collecting and processing procedure. Further there is proposed filtering process which aim to remove noise points from point clouds and remove vegetation with combination of vegetation index ExG, clustering algorithm DBSCAN and Hough Transform. The proposed method is tested on the selected rock formation in Bohemian Switzerland National Park. The evaluation of the proposed method is based on comparison of models filtered with proposed method with reference models, which are filtered manually. Finally, the achieved accuracy of the models is evaluated using geodetic measurements.

## **key words**

laser scanning, photogrammetry, UAV, point cloud, data filtering