



UAS-based assessment and monitoring of protective constructions in alpine areas, Lueg Pass, Austria

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Protective structures against natural hazards such as rockfall or avalanches are essential for safe infrastructure operation in alpine regions. In order to preserve its protection function, protective structures have to be constantly monitored and inspected, frequently under extreme environmental conditions.

Advanced unmanned aerial systems (UAS) allow the detailed detection and monitoring of protective structures. The quick, targeted UAS-based generation of photos, videos, orthophotos and digital terrain models reduces risks for supervising personnel and enables systematic documentation.

This contribution investigates new technical opportunities for a systematic monitoring of protective structures in consideration of the Austrian standard rule “Permanent Technical Protection against Rockfall” (ONR 24810). Our study explicitly integrates the entire lifecycle of a protective structure which encompasses planning, inventory and measures during the operational phase (constant monitoring, supervision and evaluation).

The study site of this contribution is located near the Lueg Pass, in a deeply incised section of the Salzach valley, situated in the province of Salzburg, Austria. Railways, motorways, federal main roads and high-voltage power lines pass through the study site. Due to the valley’s narrowness, air space is limited and light conditions change rapidly, creating a challenging setting for safe and successful UAS operation. The present amount of critical infrastructure combined with complex environmental conditions make for an ideal setting to test the limits of advanced UAS systems for infrastructure inspection.