SAFETY MAPPING OF THE VEGETATION ALONG THE TRANSPORT INFRASTRUCTURE

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On behalf of the research team
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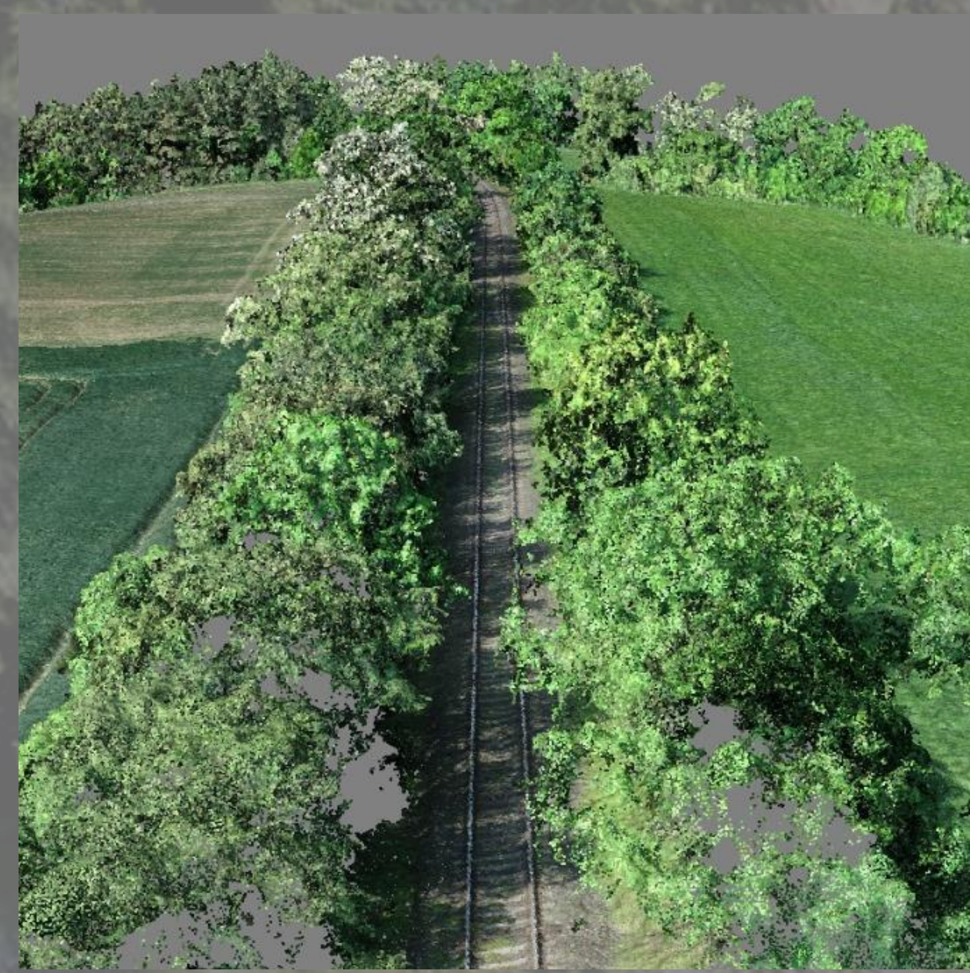
INTRODUCTION

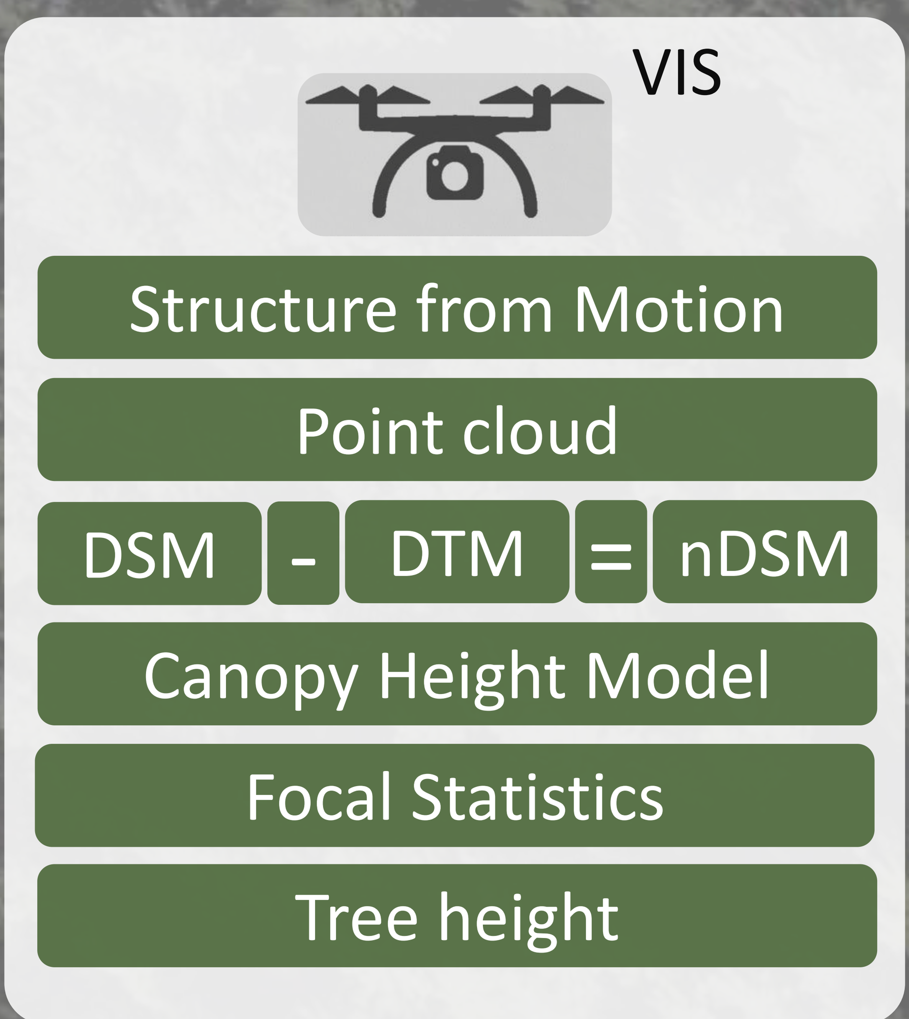
At present, the condition of trees is obtained by ground field surveys, which is very ineffective and often not a sufficiently accurate way of data acquisition in terms of time, personnel and economics. Detection of potentially dangerous trees by unmanned aerial vehicles along any transport infrastructure can significantly improve the yield of the necessary information at the individual tree level. According to Railway Infrastructure Administration, 612 trees fell on the railway last year (2018). In many cases, these accidents were caused by natural phenomena regardless of tree health. This research presents a demand response driven by Railway Infrastructure Administration and Road and Motorway Directorate of the Czech Republic.

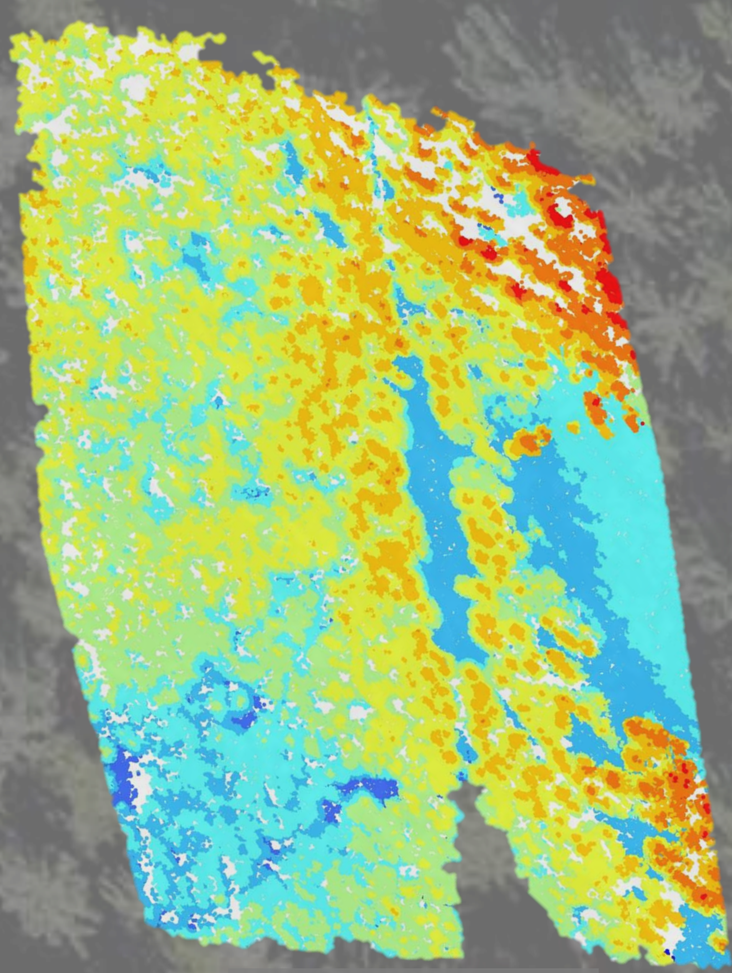


OBJECTIVES

To develop a methodology for the identification of trees dangerous to the passengers and the infrastructure itself. The main aim of this research is to certify this methodology.

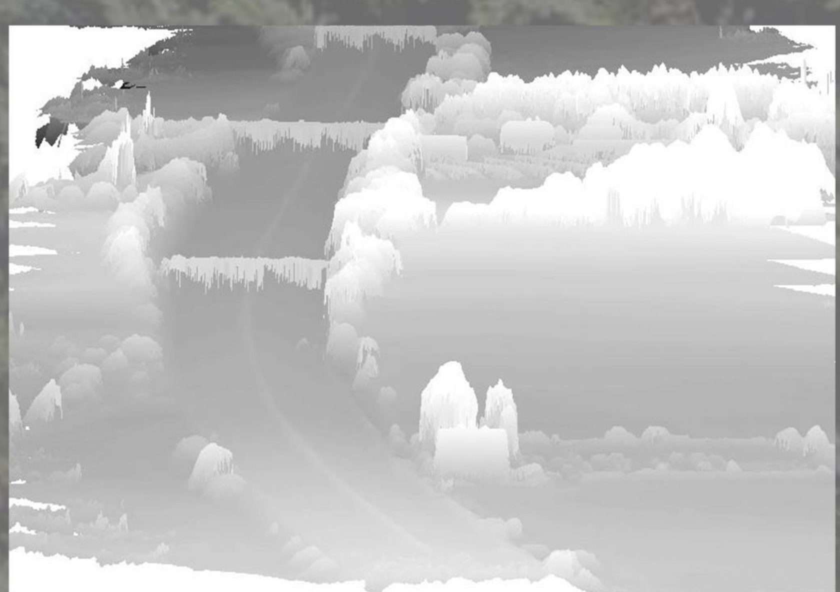
METHODOLOGY





Point cloud

Digital Surface Model (on the left) is a digital elevation model that contains all objects present on the ground, whereas the Digital Terrain Model (on the right) represents only the elevation of the ground.

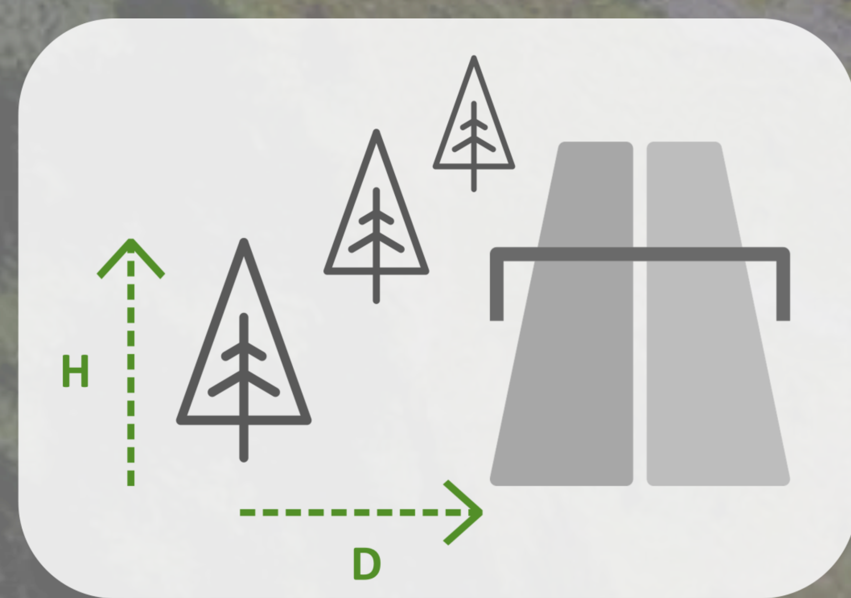


The difference between DSM and DTM provides a normalized Digital Surface Model, which highlights off-terrain objects and provides information about their height.

RESULTS AND CONCLUSION

Trees are considered dangerous if their height is bigger than their distance to roads or railways.

H > D = ⚠



The picture below shows a section of highway D6; trees that were identified as potentially dangerous are marked by red triangles, while trees not presenting safety risks are marked by green triangles.

The output is a layer of potentially dangerous trees containing information about their location, height and distance.

It is possible to use unmanned aerial vehicles to detect trees which can cause damage to transport infrastructure.

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