

# Statement of doctoral thesis

Candidate: Ing. Martin Vel'as, Brno University of Technology, Faculty of Information Technology

Title: 3D Mapping from Sparse Lidar Data

The thesis by Martin Vel'as describes all stages in the development of a working 3D laser scanning system for both indoor and outdoor mapping, from hardware design to automated registering/georeferencing of the collected data. In addition, automated methods for laser data intensity correction and ground point classification is developed.

To my best knowledge all presented methods are novel and up-to-date at the time of the manuscript creation. Thesis is based on six scientific articles published at an appropriate level in peer-reviewed publications, proving that Martin Vel'as is a person with an outstanding research erudition. The articles have also gained a good number of citations given the short time after publication.

I was impressed by the careful and thorough testing during the different stages of algorithm and hardware development, and I believe that the results have an impact on the 3D lidar mapping research and industry.

To my opinion the doctoral thesis of Ing. Martin Vel'as meets the requirements of the proceedings leading to PhD title conferment.

In Ähtäri, Finland, August 30<sup>th</sup> 2020

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