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PERFORMANCE ANALYSIS OF A POLE AND TREE TRUNK DETECTION METHOD FOR MOBILE LASER SCANNING DATA

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Abstract. Dense point clouds can be collected efficiently from large areas using mobile laser scanning (MLS) technology. Accurate MLS data can be used for detailed 3D modelling of the road surface and objects around it. The 3D models can be utilised, for example, in street planning and maintenance and noise modelling. Utility poles, traffic signs, and lamp posts can be considered an important part of road infrastructure. Poles and trees stand out from the environment and should be included in realistic 3D models. Detection of narrow vertical objects, such as poles and tree trunks, from MLS data was studied. MLS produces huge amounts of data and, therefore, processing methods should be as automatic as possible and for the methods to be practical, the algorithms should run in an acceptable time. The automatic pole detection method tested in this study is based on first finding point clusters that are good candidates for poles and then separating poles and tree trunks from other clusters using features calculated from the clusters and by applying a mask that acts as a model of a pole. The method achieved detection rates of 77.7% and 69.7% in the field tests while 81.0% and 86.5% of the detected targets were correct. Pole-like targets that were surrounded by other objects, such as tree trunks that were inside branches, were the most difficult to detect. Most of the false detections came from wall structures, which could be corrected in further processing.

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