

# Comparative Analysis of Automatic Methods for Road Infrastructure Elements Extraction from Point Cloud

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## SUMMARY

Spatial information is used for various purposes - creating maps of different types, digital terrain models, for traffic management and many others. As the application of spatial information expands, the requirements for accuracy, precision and level of detail increase. Laser scanning technology is one method of collecting spatial data that can follow current trends and requirements. The main output product is point cloud, ie. set of 3D points positioned in space. As high-resolution cameras are increasingly being implemented in this laser scanning system, high-resolution photos are also being obtained. Those photos showed as very useful during visual inspection of the terrain.

Accordingly, the post-processing of data obtained with this technology implies a complete set of tasks. The goal is to group these tasks, reduce execution time and improve the final result. For example, the term inventory of road infrastructure implies structural lines: lines of edges and the middle of the road, top and bottom lines of curbs, channels, etc. In addition, the inventory includes other spatial entities, such as white lines on the road, pedestrian crossings, bicycle paths, buildings, poles, traffic signs, trees, fences, borders of different cultures.

Therefore, it is clear that the inventory of road infrastructure includes numerous elements and that manual drawing requires a lot of time. That is why an intensive work on the automation of these processes is being done. However, there are currently no completely automated solutions that extract all of mentioned elements with satisfactory quality. Certain commercial solutions offer digitization of individual elements, in ideal or closely ideal conditions. The aim of this paper is to provide a detailed insight into current achievements on the topic of automatic extraction of road infrastructure elements. The results of the research and the new proposed methodologies of automatic extraction of particular elements from point cloud will be presented. At the end of the paper, a comparison of the latest methodologies and discussions on the obtained results will be

done.

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