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Volume XXXIX-B3

PLANAR PROJECTION OF MOBILE LASER SCANNING DATA IN TUNNELS

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Keywords: Laser scanning, point cloud, automation, adjustment, rectification

Abstract. Laser scanning is now a common technology in the surveying and monitoring of large engineering infrastructures, such as tunnels, both in motorways and railways. Extended possibilities exist now with the mobile terrestrial laser scanning systems, which produce very large data sets that need efficient processing techniques in order to facilitate their exploitation and usability.

This paper deals with the implementation of a methodology for processing and presenting 3D point clouds acquired by laser scanning in tunnels, making use of the approximately cylindrical shape of tunnels. There is a need for a 2D presentation of the 3D point clouds, in order to facilitate the inspection of important features as well as to easily obtain their spatial location.

An algorithm was developed to treat automatically point clouds obtained in tunnels in order to produce rectified images that can be analysed.

Tests were carried with data acquired with static and mobile Riegl laser scanning systems, by Artescan company, in highway tunnels in Portugal and Spain, with very satisfactory results. The final planar image is an alternative way of data presentation where image analysis tools can be used to analyze the laser intensity in order to detect problems in the tunnel structure.

Conference Paper (PDF, 778 KB)

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