Computation of road geometry parameters using mobile LiDAR system

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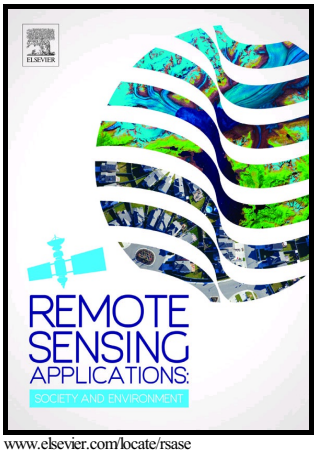

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Computation of road geometry parameters using mobile LiDAR system

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Abstract: The continuous assessment of road geometry parameters is important for road condition analysis and the required maintenance work. Mobile LiDAR system (MLS) is being frequently used for roadway data collection due to its capability of accurate and dense three-dimensional data acquisition at highway speed. The high-precision road terrain obtained in terms of the point cloud is used as primary data for road geometry parameters computation. An automatic method is proposed in this research paper for computing road width, road centerline, longitudinal slope and cross slope. Initially, an equation of the line as a best-fit polynomial is used to represent road boundary as connected piecewise linear segments. Further road width and road centerline are computed. MLS data points at road boundary and road centerline are used to compute road slopes. The root mean square error of 2.1%, 2.5%, and 2.2% for longitudinal slope, cross slope (left lane), and cross slope (right lane), respectively were obtained. Proposed method works efficiently on the MLS data points of complex and heterogeneous roadway scene.

Keywords: Mobile LiDAR System (MLS); Road Geometry Parameters; Road Width; Road Centerline; Longitudinal Slope; Cross Slope

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