Maintenance management system using road images and 3D data

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ABSTRACT

For road managers to properly operate roads, it is necessary to immediately confirm road damage, perform frequent periodic inspections to check for defects and damage, transfer business knowledge, and develop human resources. To realize appropriate road maintenance, it is important to share information among all stakeholders, and easily shared three-dimensional (3D) data with high visual fidelity are effective means toward this end. With the introduction of unmanned aerial vehicles (UAVs) and terrestrial laser scanners (TLS), there will be increased use of 3D data in the future. In this study, TLS, UAV, and camera measurements on road pavement, bridges, and slopes were performed with the aim of realizing 3D data for road maintenance. We also investigated methods for collectively managing the generated 3D data and visualizing results of inspecting the 3D data and proposed the information system using 3D data and images. Furthermore, a road maintenance management system was proposed using images from vehicle-mounted cameras and investigated its feasibility. Two system use cases were considered for the system: the case of receiving notification of an abnormality from a road user and passing on knowledge. The system includes functions for same-screen display of images and maps, and storing descriptions of abnormalities. It was inserted GNSS data, display abnormality descriptions, and store photos. As a result, we contributed the collection of video data for roads, the combination of two different angle video data, and the usage of video images for road maintenance management system.