The Summer Undergraduate Research Fellowship (SURF) Symposium
2 August 2018
Purdue University, West Lafayette, Indiana, USA

Real-Time Non-Contact Road Defect Detection Using Inexpensive Sensors

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ABSTRACT

Road defects such as potholes, humps, and road cracks have become one of the main concerns for road and traffic safety worldwide. Pavement defect detection is crucial to ensure road safety. However, current solutions to this problem are either too time-consuming or too expensive to be employed large-scale. We propose a novel approach which has the ability to autonomously detect potholes in real-time using cost-effective sensors. Inexpensive sensors are mounted on a vehicle and a deep learning algorithm is used to identify road defects. The detection system is paired with a GPS and positional sensors to map the location of the pothole. The data that is collected is annotated and used to train deep learning networks to learn the patterns of potholes. This approach is low-cost, accurate and time-saving. It can potentially be employed in large-scale crowdsourcing of road condition data where normal road users constantly update the road conditions as they use the roads.

KEYWORDS

Road defect detection, pavement distress, pothole detection, inexpensive sensors, deep learning, sensor fusion