

ABSTRACT

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Title: CONVOLUTIONAL NEURAL NETWORKS FOR PAVEMENT CRACK DETECTION USING ASPHALT PAVEMENT IMAGES

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Traffic accidents represent a major socioeconomic problem with a growing number of deaths annually. It was reported that approximately 1.3 million people die and about 50 million people are injured every year in traffic accidents worldwide. One of the leading causes of accidents can be attributed to pavement conditions. The detection and classification of pavement cracks heavily relies on the experience of an engineer. In addition, it is an extremely time-consuming process. There has been considerable work done in pavement crack detection in the last few years. In this research, our goal is to understand the nature of pavement cracks and to automate the detection process through the development of a recognition model for crack detection. Convolutional Neural Networks have demonstrated success in handling numerous image classification problems. This paper provides an innovative method to detect pavement cracks with a convolutional neural network. Our experimental setup involves two stages: (1) process the pavement crack images using Principal Component Analysis (PCA) and extracting the most significant features from the image and (2) building the detection model using the generated images from the previous stage. The experimental results show the advantages of the method.