

Detection of Potholes Using Image Processing Method



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Abstract Potholes are a common problem on roads, caused by weather, vehicle activity, and poor maintenance. Potholes can be hazardous for drivers, cars, and motorcycle riders. Potholes are often filled with asphalt or concrete. A methodology for automatically identifying potholes on road surfaces using computer vision methods is potholes detection utilizing image processing. This technique can be used to improve road maintenance by quickly locating potholes, enabling early repairs, and lowering the risk to drivers and their cars. This study emphasizes a Gaussian noise filtering technique for the developed infrastructure of image pre-processing stage. Thus, this study also suggests four methods for segmentation detecting potholes in images: image thresholding (Otsu), Canny edge detection, K-means clustering, and fuzzy C-means clustering. The effectiveness of the different image segmentation techniques was tested in MATLAB 2019a, and the results were generated in terms of accuracy and precision. The results were compared with each other to draw a conclusion on their viability.

Keywords Image processing · Pothole detection · Fuzzy C-means clustering · Canny edge detection · Image thresholding · K-means clustering

1 Introduction

Most going great nations now be blessed with paved roads which spanning most of their land area and which has made it easier for people to travel from place to place as part of their everyday lives [1]. According to research on road fatalities in Malaysia, road defects are responsible for roughly 11.25% of all fatal crashes, while potholes are responsible for 11.2% of all crashes [2]. A pothole is a depression in the road's surface, typically asphalt made, where driving has harmed the pavement. Potholes arise for a variety of reasons, but the main ones are pressure from moving traffic, a

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