POTHOLES DETECTION USING UAV WITH DEEP LEARNING ALGORITHM FOR ROAD INSPECTION

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**Thesis submitted to the Universiti Teknologi MARA Malaysia
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DECLARATION

I declare that the work on this project/dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA (UiTM). This project/dissertation is original and it is the result of my work, unless otherwise indicated or acknowledged as referenced work.

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ABSTRACT

Road inspection is of paramount importance and should always be kept up-to-date to ensure the safety of road users. This regular evaluation of road conditions is crucial for identifying and rectifying potential hazards such as potholes, structural damage, and road sign visibility issues. By maintaining well-inspected and safe roads, the risk of accidents and injuries is significantly reduced, creating a safer and more efficient transportation network for everyone. In today's rapidly evolving technological landscape, many studies have demonstrated the feasibility and effectiveness of using AI-based methods for road pothole detection, showcasing high-precision real-time intelligent detection of road pothole. The local authority still uses the conventional road inspection method. However, this method has its drawbacks. Conventional road inspection methods, while essential, often face challenges of inefficiency and delayed response to critical road issues. These challenges are exacerbated by the increasing complexity of road networks and the need for timely maintenance. To address these challenges and leverage the benefits of technological advancement, this study aims to evaluate the performance of Convolutional Neural Network in detection of road pothole. Proactive road maintenance not only enhances safety but also minimizes costs, reduces traffic disruptions, and supports sustainable urban development. This method of study will assess the detection and accuracy of road pothole classification of deep learning which is Convolution Neural Network (CNNs), enabling analysis for the prompt detection of road issues. This study will ensure that maintenance crews have access to detailed information about road conditions, enabling them to identify and prioritize necessary repairs accurately. This will help government agencies like Jabatan Kerja Raya (JKR) in road inspection and maintenance as they still use conventional methods for road inspection.

Keywords: Road inspection, Pothole detection, Artificial Intelligent, Unmanned Aerial Vehicle, Convolution Neural Network

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