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Few-Shot Learning for Pothole Detection

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Abstract

Research on road pothole detection has been ongoing for the past two decades, with significant progress made in the domain of semantic segmentation for detecting potholes. However, such approaches require a large amount of data, which can be difficult and expensive to collect. In this context, the author identifies a research gap in the development of few-shot learning algorithms for road pothole detection, which could reduce data-gathering effort and computational costs.

The primary motivation for this research is to address the limitations of manual visual inspection, which remains the primary method for detecting road potholes. This process is not only tedious and time-consuming but also dangerous for inspectors, and the results are often subjective. Developing a few-shot learning algorithm for pothole detection could offer a safer, faster, and more objective approach to identifying potholes on roads.

To address this research gap, the author proposes a novel approach that leverages deep stereo matching networks and image classification DCNNs to detect road potholes using few-shot learning. The proposed approach aims to minimize the need for large, well-annotated datasets while delivering high-accuracy pothole detection. The research objectives include conducting a literature survey, specifying project requirements, designing and implementing the pothole detection model, and testing and evaluating the model's performance using appropriate metrics.The scope of the research covers the development of the algorithm and its evaluation using appropriate metrics, with a focus on minimizing the need for large datasets and delivering high-accuracy pothole detection.