

Review of: "CNN-Based Road Damage Detection"

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Potential competing interests: No potential competing interests to declare.

Summary: The manuscript presents a study on the use of Convolutional Neural Networks (CNNs) to detect road surface deteriorations such as cracks, potholes, and bumps. It outlines a method involving image collection, preprocessing, CNN model construction, and performance evaluation, achieving an impressive accuracy of about 90%. The work underscores the potential of CNNs to enhance road maintenance and safety through accurate and timely damage detection.

Positive Aspects:

1. The manuscript effectively showcases the application of CNNs in intelligent transportation systems, marking a significant technological advancement.
2. The authors mention an accuracy rate of around 90%, indicating robust model performance.
3. The paper provides a thorough description of the methodology, enhancing its reproducibility and transparency.
4. The authors discuss the practical applications of the system, emphasizing its potential to significantly reduce road maintenance costs and improve safety.

Areas for Improvement:

1. The manuscript does not address the diversity of the dataset in terms of geographical and weather variations, which are crucial for assessing the model's generalizability.
2. The manuscript claims high accuracy but lacks a comprehensive comparison with existing methods, which could provide a clearer context for its contributions.
3. Some sections could benefit from more detailed explanations, especially regarding the CNN architecture specifics and the hyperparameter tuning process.
4. I think the manuscript should include a more detailed comparison with other state-of-the-art methods in road damage detection. This includes contrasting the proposed CNN model's performance against other deep learning architectures and traditional image processing methods documented in recent research. Moreover, discussing aspects like speed, scalability, and operational costs in comparison to these methods would be beneficial.
5. I believe the quality of the manuscript is generally high, characterized by a clear presentation and a well-structured methodology. However, the utilization of state-of-the-art methods could be better highlighted. For example, discussing advancements in CNN techniques, such as the incorporation of more complex architectures like YOLOv5, could strengthen the claims about the effectiveness of the proposed system.

