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TECHNOLOGY LICENCING OPPORTUNITY

Structure defect detection using machine learning algorithms

Technology Details

The structure defect detection (SDD) system utilizes machine learning algorithms in the form of convolutional neural networks (CNNs) to identify defects in materials such as concrete. The CNN is trained using a database of images to detect various types of structural issues, including cracks on surfaces. The system incorporates a two-stage scanning process to improve detection accuracy and reduce the likelihood of missing cracks or defects that may lie on scan boundaries. Additionally, region-based CNNs are used to detect specific defect types by analyzing localized areas of the scanned images.

Applications

Concrete Surface Inspection: The system can be used to inspect concrete surfaces in infrastructure such as bridges, roads, and buildings for cracks, wear, or other types of damage. Early detection of defects enables timely maintenance and repair.

Construction and Structural Integrity Monitoring: The technology is ideal for ongoing monitoring of construction sites and structural integrity, ensuring that any defects are detected early, preventing costly damage or collapse.

Technology Benefits

This structure defect detection system leverages machine learning, specifically convolutional neural networks (CNNs), to automatically identify and classify defects such as cracks in concrete. The two-stage scanning process ensures complete coverage and minimizes the chance of defects being missed. The system's use of region-based CNNs enhances the accuracy of localized defect detection, making it ideal for real-time, automated inspection of various structures. This technology offers significant improvements in efficiency, accuracy, and maintenance, providing a powerful tool for infrastructure monitoring and defect detection.

Benefits include: Increased Detection Accuracy, Improved Defect Localization; Enhanced Efficiency; Scalability; Proactive Maintenance:

Development Stage

SDD has undergone parametric and comparative studies demonstrating its effectiveness in controlled environments. The technology has been tested to show improvements in crack detection for roads and cement structural applications. Next steps will refine the technology, improve its real-world applicability, and ensure that the structural defect detection system is fully optimized for operational deployment in challenging environments.

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