

Defect Localization and Interaction on Surfaces with Projection Mapping and Gesture Recognition

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Abstract : This paper presents a method for accurately localizing and interacting with known surface defects by overlaying patterns onto real-world surfaces using a projection system. Given the world coordinates of the defects, we project corresponding patterns onto the surfaces, providing an intuitive visualization of the specific defect locations. To enable users to interact with and retrieve more information about individual defects, we implement a gesture recognition system based on a pruned and optimized version of YOLOv6. This lightweight model achieves an accuracy of 82.8% and is suitable for deployment on low-performance devices. Our approach demonstrates the potential for enhancing defect identification, inspection processes, and user interaction in various applications.

Keywords : defect localization, projection mapping, gesture recognition, YOLOv6

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