

# Real-Time Image Animation using AI Machine Learning and Deep Learning

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**Abstract:** *Augmented Reality (AR) and Artificial Intelligence (AI)-driven animation are revolutionizing maintenance operations by enabling real-time, interactive guidance. Traditional methods, such as FARA [1], have introduced geometry-based AR authoring approaches for maintenance tasks. However, this paper presents a novel deep learning-based animation system that automates the synthesis of facial expressions and object motions, enhancing AR-assisted maintenance processes. By leveraging AI-driven motion analysis, the proposed system streamlines maintenance workflows, improves precision, and reduces human intervention in animation creation. The integration of deep learning techniques ensures adaptive and responsive animation sequences, optimizing operational efficiency and user experience in maintenance environments. This approach represents a significant advancement in AR-guided repair and maintenance, setting the foundation for future intelligent maintenance solutions.*

**Keywords:** Augmented Reality (AR), Artificial Intelligence (AI), AI- driven animation Maintenance operations, Real-time interactive guidance, Deep learning-based animation Facial expression synthesis, Object motion automation, AR-assisted maintenance..

