

Predictive Maintenance of Medical Equipment Using AI and IoT

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Abstract: *This research presents a novel approach to predictive maintenance of medical equipment utilizing artificial intelligence (AI) and Internet of Things (IoT) technologies. The healthcare industry has witnessed unprecedented growth in medical equipment manufacturing, creating a critical need for optimal maintenance strategies. Our proposed system leverages IoT sensors for real-time data collection, deep learning algorithms for defect detection, and an automated physical separation mechanism for equipment classification. The implementation combines Python-based deep learning applications with an Arduino-controlled conveyor system to identify, classify, and separate medical equipment based on their condition. Experimental results demonstrate significant improvements in maintenance efficiency, reduced downtime, and enhanced equipment reliability compared to traditional maintenance approaches. This predictive maintenance framework offers healthcare facilities a cost-effective solution to ensure optimal functionality of critical medical equipment, ultimately contributing to improved patient care quality and safety.*

Keywords: Predictive Maintenance; Medical Equipment; Artificial Intelligence; Internet of Things; Deep Learning; Convolutional Neural Networks; IoT Sensor Networks; Anomaly Detection; Machine Learning; Healthcare Automation; Equipment Reliability; Preventive Maintenance; Real-Time Monitoring; Arduino-Based Control; Automated Inspection Systems.

