AI AND DATA ANALYTICS: TRANSFORMING RESEARCH METHODOLOGIES

FAULT DETECTION METHOD FOR TAIL ROPE

USING MACHINE LEARNING

Abstract:

The project focuses on using machine learning to detect severe faults in tail ropes automatically. It leverages pattern recognition capabilities in machine learning algorithms to create an automated system for analyzing tail rope images. The system is trained on a large, carefully labeled dataset that includes different types of faults, enabling it to detect and classify potential issues in new images during deployment.Compared to traditional inspection methods, this automated approach provides several benefits, such as increased accuracy, efficiency, and the ability to continuously learn and improve over time. By analyzing images for defects, the system can objectively evaluate tail rope integrity, potentially transforming inspection practices across various industries. The method uses the Inception V3 algorithm, a deep convolutional neural network architecture developed by Google. Inception V3 excels in image classification tasks by using convolutional filters and modules that capture different features of the image in parallel. This hierarchical approach allows the model to learn complex image patterns, leading to better fault detection accuracy. Overall, this data-driven solution automates the inspection process and offers a more objective, efficient, and continuously improving way to evaluate tail ropes, potentially revolutionizing maintenance practices in sectors that rely on rope integrity.

Keywords: image processing, machine learning, deep learning, Inception V3 algorithm.