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AI-Powered Visual Inspection Enhances Welding Quality Control

In industrial metalworking, a camera monitors the welding process. Traditionally, a worker would then visually inspect the finished part for quality. Now, ITM's advanced AI application automatically analyzes the footage, significantly reducing the need for manual inspection and improving overall quality control.



AI-Powered Visual Inspection: Unlocking Industry 4.0's Potential for Quality and Efficiency

AI-powered visual inspection is poised to revolutionize industrial production by unlocking the next level of automation, a key pillar of Industry 4.0. This technology enhances quality control and reduces manual effort. Implementing AI-based visual inspection solutions serves as a crucial stepping stone for manufacturers to embrace wider AI adoption, driving efficiency, productivity, and competitiveness in the digital age.



AI
Quality Control
Welding Automation

ITM Case Study: Predictive Quality

Edge AI Revolutionizes Real-Time Quality Inspection

In a recent client project, ITM successfully implemented an AI-powered edge computing solution to revolutionize welding quality inspection. By deploying the application directly next to the welding robot, we enabled real-time predictions on weld quality, significantly reducing the need for manual inspection.

The data collected during the welding process is transmitted to the cloud for further analysis and model training, continuously improving the accuracy and effectiveness of the inspection process. Through this innovative approach, we were able to achieve substantial reductions in manual effort in two key areas:

- ✓ **Immediate Rework:** If a defect is detected, the part is automatically rewelded within the robot's cycle, eliminating the need for manual removal and reinsertion.
- ✓ **Targeted Inspection:** Only parts flagged by the AI as potentially defective require manual inspection, freeing up valuable human resources.



**Real-Time
Quality
Predictions**

**Reduction of
Manual Effort**

**Increase of
Quality**

