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IBM Maximo Production Quality Insights SaaS Visual Insights

Highlights

- Reduces quality inspection costs
- Creates consistent inspection processes
- Reduces inspection time
- Improves accuracy of defect identification
- Uses edge processing for rapid image acquisition and processing
- Pairs AI and human expertise to create defect models
- Utilizes existing camera and image capture systems

Resolve quality problems on the factory floor faster with artificial intelligence

Automation and adoption of IoT technologies has increased the speed of production. However, in many instances inspection processes remain a bottleneck.

From a workforce perspective, there are also challenges around training, inconsistency of skills, knowledge gaps and employee turnover. These are all compounded by increasing labor costs, and leads to the need for improved inspection processes.

Just as advances in automation and IT have made manufacturing processes more efficient and consistent, artificial intelligence (AI) provide similar advances in the areas of quality control by reducing inspection time and improving consistency of defect detection.

IBM Maximo PQI Visual Insights can help to significantly accelerate inspection processes by comparing images captured by ultra-high-definition digital cameras against a library of known defect images. It can then rapidly detect (through processing on edge computing servers) parts, components, assemblies and products that do not meet quality specifications.

It incorporates AI to detect and classify defects, and help to identify emerging quality defects more quickly. It calculates a confidence level— zero to 100% for every defect detection. Detections that do not meet the confidence level threshold are flagged for further review. The library of defect images can easily be expanded to accommodate new or changing inspection needs.

This solution has several key strengths:

Allows you to build a library of defect images. The model manager identifies sets of images which depict good and not-good parts, components, assemblies or products; for example, misaligned or missing components on a circuit board, surface scratches, paint bubbles, x-rays indicating internal cracks, incorrect labels, corrosion or improperly machined parts represent types of defects that may be encountered during production. For a specific circuit board there may be dozens of images that represent the types or variety of defects typically encountered. For a highly-polished surface any evidence of a scratch would indicate a defect. For a machined part, incorrectly aligned holes or improper dimensions would indicate defects

Centrally manages the process of creating, expanding and refining the defect image library and models through the cloud. It also manages the processes of tracking the development and deployment of the models as they progress from model manager to data scientist to deployment on the factory floor.

Can provide a confidence level for every comparison. For example, if no defect is found, and there is a perfect match between the inspection image and the good image the confidence level would be 100 percent. If no defect is found, but there is not a perfect match between the inspection image and the good image the cognitive model might indicate a confidence level of 85 percent.

Apply human expertise only when needed. Confidence level calculations ensure that inspectors focus only on those items that require human expertise to accurately determine if a defect exists.

Easily expand the library of defect images. Model managers can easily add images that represent new defects caused by variability in manufacturing processes or associated with the introduction of new products or revisions. Data scientists then use these images to enhance existing defect models or create new models to accommodate new products or product revisions.

Use machine learning for visual feature extraction

Employs machine learning techniques for image recognition and processing. These include impurity/high-contrast area detection, geometry feature detection and verification, abnormal texture area detection, color and brightness feature extraction and verification, and difference detection by supporting translation and rotation variants.

Improve accuracy of defect identification

When detecting and identifying a defect, this solution provides a confidence level. This can be used to automate defect identification whenever thresholds are above an established confidence level, or have the defect reviewed and verified by an inspector whenever the confidence level is below the threshold.

Edge processing for rapid image acquisition and processing

Cloud based machine learning and management functions create defect models which are then distributed to edge computing devices on the factory floor to rapidly process images captured by inspection cameras and detect and identify any defects.

Utilize existing camera and image capture systems

This solution does not depend on any proprietary camera capture hardware or technologies. This makes it easy to work with existing systems, and allows organizations that may have multiple capture technologies to deploy visual inspection capabilities throughout their facilities.

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Why IBM?

This solution offers clients the ability to leverage the benefits of both edge computing ("the edge") and the IBM Cloud with flexible deployment models. IBM can deploy models locally on the edge for fast response with compute-intensive model building in the cloud.

It is also purpose-built for quality inspectors, managers and supervisors. This means that all design specifications are built with the end-user in mind.

Finally, it is powered by artificial intelligence, which means faster deployment and return on investment, as well as the ability for the technology to continuous learn and improve its library of knowledge.

Next steps

→ Watch the Demo

→ Visit the IBM Marketplace

For more information

To learn more about IBM Maximo PQI Visual Insights please contact your IBM representative or IBM Business Partner, or visit the following website(s): ibm.co/visualinsights

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