Surface Inspection using Machine Vision

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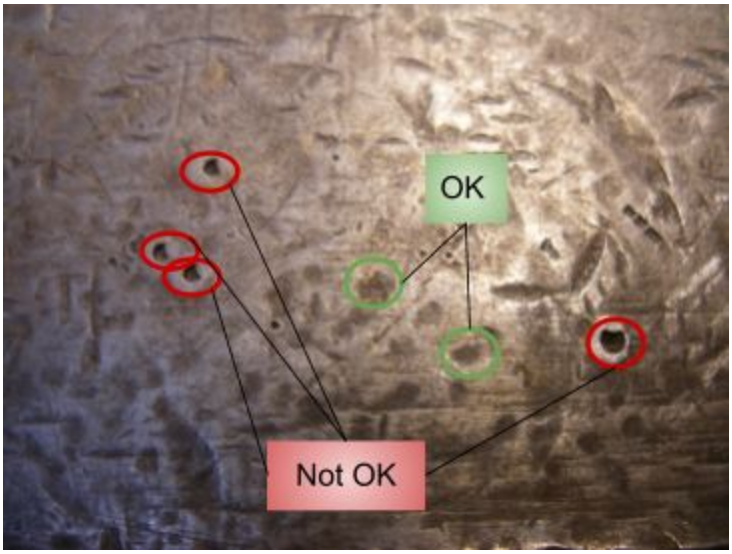
Summary

Machine Vision can be used where human visual processes are not reliable and can lead to errors. One such example is in identifying surface anomalies (such as scratches, dents, pits, holes, etc). Qualitas has developed a solution for identifying these defects using the latest Deep Learning Artificial Intelligence Technologies, making it one of the most accurate systems available in the industry.

Artificial Intelligence

The technology behind these advanced inspection systems is the use of Artificial Intelligence or AI as it's popularly know. The concept behind this technology is to make machines and software think and arrive at decisions just like humans. Imagine that you're trying to teach a human quality inspector on what anomaly constitutes an unacceptable anomaly and what constitutes an acceptable anomaly, you will teach them by using examples.

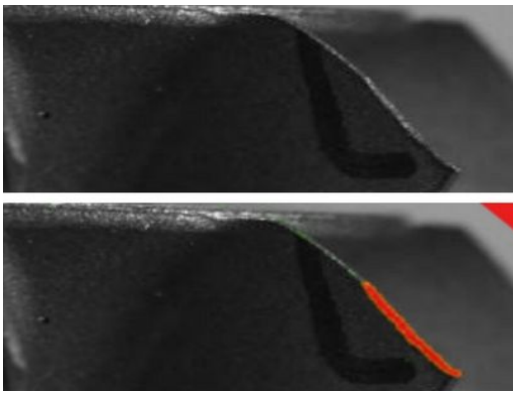


In the example picture, if you want to teach a system to identify anomalies like the ones in red and ignore the

anomalies marked in green, using Artificial Intelligence, the teaching is just like with humans - training by providing examples. This makes the system much more accurate and easy to train, because it not only learns what constitutes a defect, but it also learns patterns which are considered acceptable.

Applications

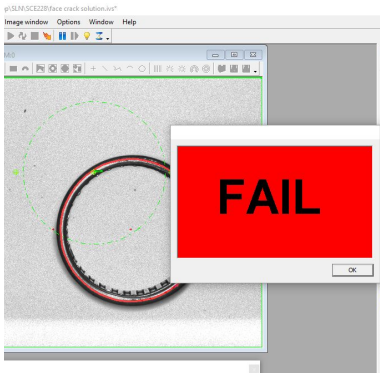
Defects in Turbine Blades



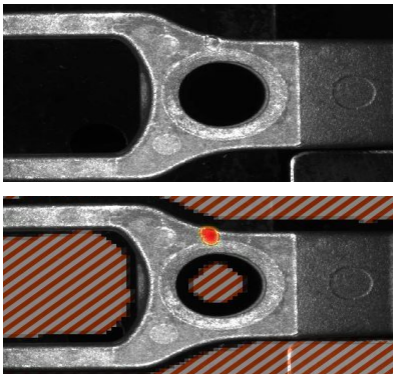
Using a front facing camera, images taken on turbine blades can find chips, dents and scratches of critical nature which are very hard to observe with the naked eye. Using a combination of Artificial Intelligence as well as Machine Vision techniques, reliable detection can be performed.

Bearing Defect Identification

In the Automotive Industry bearing is a very critical components. Defects such are unfinished surfaces, scratches on machined surfaces, etc can occur due to either improper handling or processes. Our machine vision systems can be be trained to look for these defects reliably and accurately. Yet at the same time we ensure that good parts are not flagged as defective.



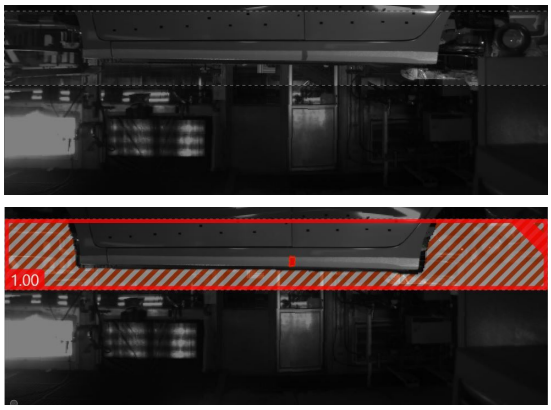
Defects in Cast Parts



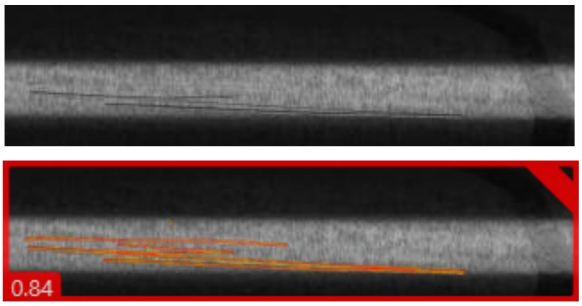
Using a set of 9 cameras, images are taken from various angles for a precision cast part used in the automotive industry. These images are then analyzed for anomalies using Machine Vision and Deep Learning algorithms to identify any surface anomalies. Using this system is very easy and and multiple variants can be inspected with a single setup.

Automotive Body Paint

Most operations in the paint shop are automated using robots. However, no process is a 100% fool proof and due to nozzle blockages and other anomalies defects arise in the paint operation in automotive manufacturing. Machine Vision can be used to detect even the smallest of deviations.



Defects in Braking Pistons



Braking components are critical elements in the automotive industry and minute surface defects can impact the performance of this important sub-assembly. Using a line scan cameras, we can image the surface of this cylindrical part and detect very reliably any surface anomalies that are present

About Qualitas Technologies

Qualitas Technologies specializes in Machine Vision Solution Development for Industrial Automation. Using the latest 2D, 3D and Artificial Intelligence solutions are proven to be reliable and accurate. Having successfully commissioned over 75 inspection systems across various applications and verticals, Qualitas' customers have seen tremendous benefits in eliminating human interventions and errors thus cutting down heavily in inspection cost and time. Qualitas has established itself as a leader in the industry and have a number of satisfied customers to its credit.

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