Automated Inspection for Factory- Improving Quality Assurance of Large Manufactured Parts

CFMS has developed and applied digital solutions and software tools to create end-to-end digitalisation of a production assembly, utilising robotics and machine learning. This enables improved process control, a reduced number of concessions and inspections and decreased cycle time. This has been achieved by connecting the supply chain, operational workers and support functions to manufacturing assets and assembly processes.

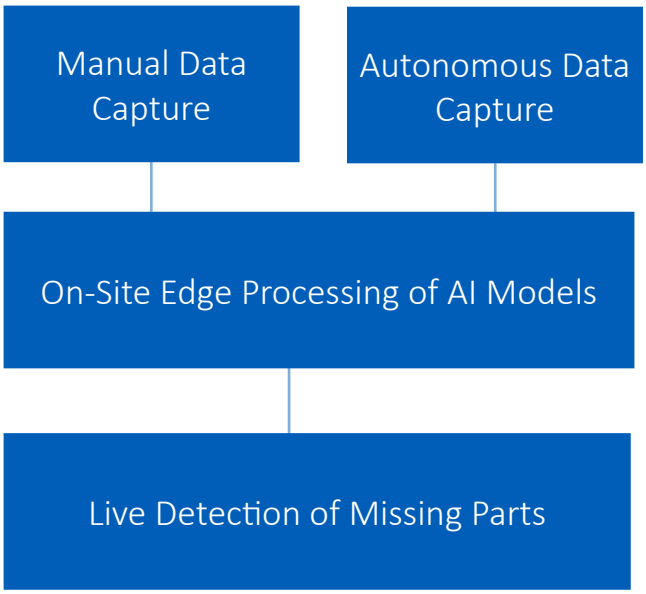
Challenge

Current digital quality assurance methods are not suited to inspect very large parts due to their size and complexity. Often, they require data to be uploaded to a computer, and then that data compared with CAD models for defects and accuracy. This manual quality assurance process is time consuming and prone to errors due to human interaction.

Solution

Automating this process through robotics and machine learning means results can be delivered on site for an operator or can be used with autonomous mobile robotics. This can therefore reduce costs, save time and reduces errors.

Process

Data is captured either manually through a camera, phone or tablet or autonomously using an autonomous robotic platform. Then the processing or inference takes place at the edge in the real time of machine learning models.

These models have been pretrained using real world data and augmented with millions of synthetically generated images from photo-realistic simulations and CAD models. Subsequently, misaligned or missing parts are highlighted in real time, meaning they can be resolved.