Leveraging Augmented Reality to Streamline Your Manufacturing Processes

Visual Inspect™ Augmented Realiy is a cost-effective mobile solution to streamline inspection and documentation tasks.

Manufacturers today are on the dawn of the fourth Industrial Revolution. It's an exciting time with the potential for rapid growth and new opportunities. However, it may be difficult to seize these opportunities with your current processes. In other words, if you need technical information but can't find it amidst the paperwork covering your desk, it might be time for a change.

In the past, complex CAD (computer-aided design) data was not available to all areas of a company, and moving large amounts of industrial data was difficult. However, today it is possible to share large amounts of data with only a tap on a mobile device. The data can be seamlessly transferred from the device and put into action. If you're looking for a way to streamline production, you may want to consider this new approach.

Meet Visual Inspect

FARO Visual Inspect is a mobile solution to control production processes. It aims to close the gap between the real and virtual worlds. Large, complex 3D CAD data can be transferred to an iPad® and used for mobile visualization and comparison to real-world conditions. This offers the potential for quality improvement, with earlier error detection in the production, construction or design processes.

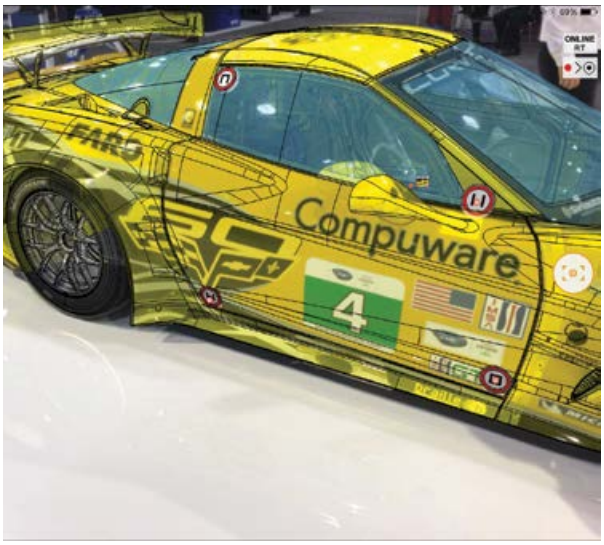
Visual Inspect brings 3D CAD viewing to a mobile solution with the 3D CAD data stored locally on the iPad through a compressed format. As such, it provides a higher degree of flexibility and mobility in addition to increased productivity. The Visual Inspect CAD interface allows operators to locate discrepancies between the CAD model and the product, in real time. If there are differences between the model and the physical product, they are immediately obvious. From there, the correction process begins at once. Operators can text or send images of any issues they find, and these can be exported for follow-up. Rather than inefficiently hunting for information, the use of paperless procedures can provide a more convenient workflow.

How It Works

A Universal CAD Translator powers the system. The Visual Inspect Algorithm provides fast, high compression of CAD files stored on a single iPad. This provides convenience and speed for the operator, as it offers a large amount storage on one device, and all the files are just a touch away. The software supports virtually all popular CAD file formats, and data is stored on the iPad in a proprietary format.

The system offers complex 3D data and augmented reality in all working environments, regardless of

With the tablet's integrated camera, an overlay of the as-built object with virtual 3D data, including all process and workflow information, can be realized in real time.



Availability of complex 3D data and Augmented Reality in all working environments, allows for quality assurance processes, wherever and whenever.

time and location. It is also a cost-effective alternative to expensive augmented reality solutions. Usage is customizable, allowing for simple viewing options as well as more complex augmented reality scenarios. In addition, the modern data handling concepts, touch functionalities and context-related menu options make system control simple.

Features

Intuitive touch functions allow for ease of operation. The 3D data can be more closely examined through the context menu, which offers various 3D elements. The operator is able to access the 3D data to get more information about features of interest, which adds efficiency. This includes absolute and relative measurement of points, edges and surfaces, as well as radii and angles.

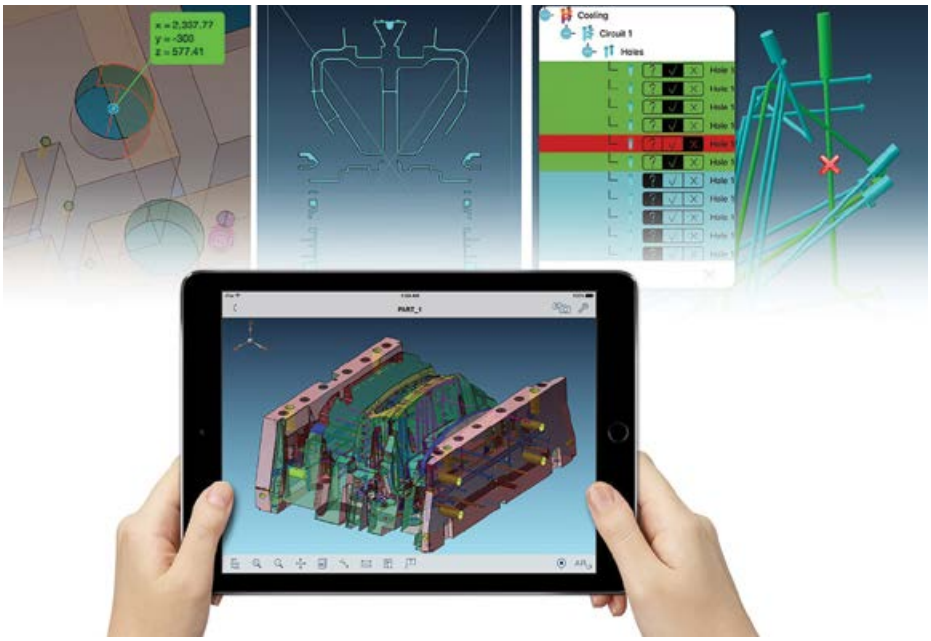
Functions offer real-time or step-by-step sectioning of parts and assemblies. Different section views are available, including 2D or 3D, and filled and unfilled. With this functionality, operators can communicate with other users through annotations in the 3D viewer, allowing them to mark errors or add advice for other users. These annotations and inspection results can be exported for follow-up work.

QR (Quick Response) code scanning also speeds up the process. The operator can open the 3D data by scanning a QR code placed on the part or assembly, and then compare the part or assembly to the CAD data. When hundreds of different parts need to be checked, this can yield impressive efficiency gains.

For Visual Inspect with Augmented Reality, an overlay of the as-built object with virtual 3D CAD data can be produced in real time. Augmented reality is the extension of a model onto the shop floor, connecting virtual reality with the actual product. The exact match between the real and virtual world is assured by a marker alignment system. When marker placement is not possible, such as for very large assemblies or space limitations, an overlay can still be created by connecting 3D points on a CAD model with 2D points in one corresponding image. Operators can take pictures and overlay CAD data and pictures at a later time. Overlays can be reproduced anytime and anywhere.

Applications

Visual Inspect can also be used to improve many difficult applications, from inspection to assembly. This includes inspection of parts, dies and molds to detect and document errors; CAD-to-part comparison in order to see real-time deviations from nominal data;



Based on intelligent functions, the user is able to interact with the 3D data to inspect the details of interest. Visual Inspect is the fastest way to check details of interest versus your 3D data.

as well as component alignment and assembly to see how complex parts should be assembled. In addition, it can also be used for quality assurance to inspect incoming parts directly at the delivery point or at the supplier site before delivery.

Visual Inspect with Augmented Reality can also be used for final inspection on site in the production space. Mistakes become apparent by directly overlaying the CAD data to the as-built part or assembly that is being inspected. Visual Inspect with Augmented Reality also supports traditional quality management methods. This might mean checking the correct installation of brake lines and flexible parts or checking the correct positioning of single parts. It is also used to verify the completeness of assemblies.

For assembly applications, the solution offers detailed information about the process – such as checking fasteners in the aerospace industry, positioning single parts, and completeness of assemblies – without complicated 2D drawings. Assembly instructions can also be provided as a video linked to annotations in the 3D data.

But Visual Inspect with Augmented Reality is not just for assembly and inspection. Other applications include construction space inspection to visualize components in the installation space, along with 3D documentation and inspection of building equipment to compare as-built installations with CAD data.

For more information, visit www.faro.com.

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