Ultrasonic AI

Motius GmbH
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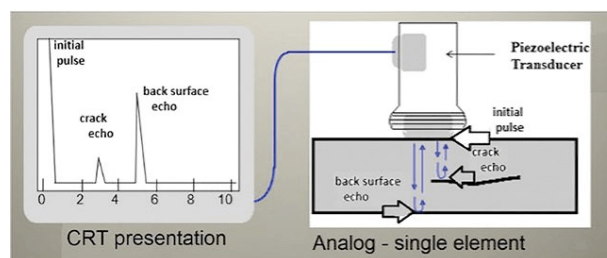
Ultrasonic AI

Aerospace   Ultrasonic Inspection

We successfully implemented an automated QA solution using ultrasonic sensors, resulting in:

- ☑ Significant **reduction in manual inspection errors** through AI-based ultrasonic inspection
- ☑ Enhanced detection of internal segregations, **reducing throw-away rate**
- ☑ **Improved operational efficiency** by automating and optimizing the inspection process

Approach

- MTU needed to ensure quality of critical engine components made from high-performance alloys

- Manual inspection only assessed surface-level defects; **internal defects went undetected**, leading to high discard rates and increased costs

- To solve this, an **AI-driven ultrasonic inspection system** was developed

- This system improved detection of internal segregations and increased efficiency in the QA process
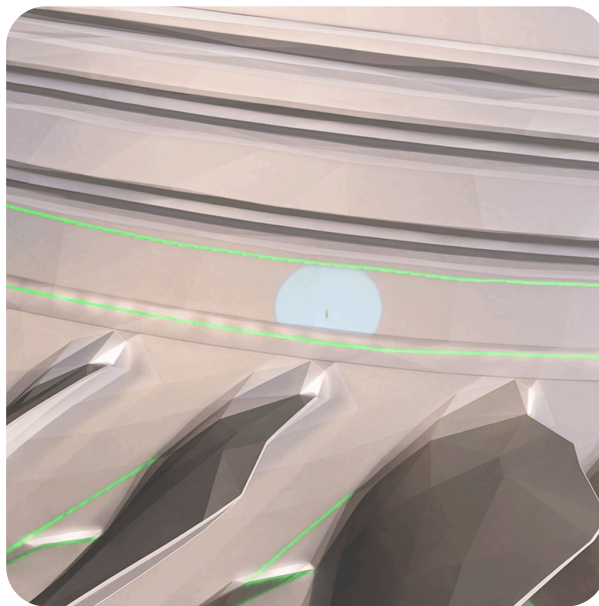

Technologies

- TensorFlow
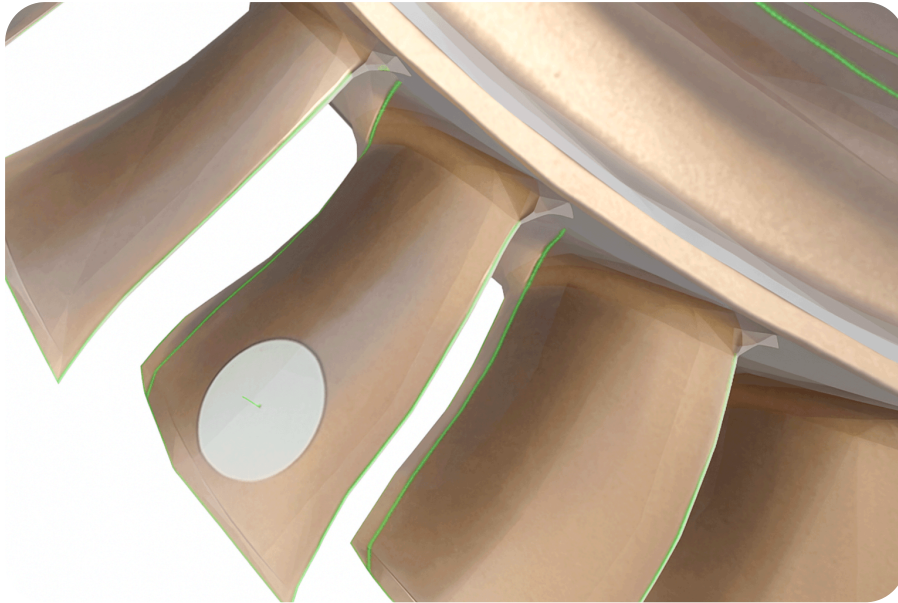- Deep Learning
- Sound Classification

Extending QA with 3D Defect Annotation

Further improving defect detection, we created a prototype that used VisionLib to track parts and enabled precise point-marking on these components. The parts are matched with a 3D virtual model in real time, which allows workers to make annotations on specific parts and defects.

- **Augmented Reality Application** to mark defects
- Object tracking also works for **rotational symmetric parts**
- **High accuracy performance** in early stage

Annotating place of part defect, example 1

Annotating place of part defect, example 2

Result

Using an **AR solution** to align CAD models with real-world turbine components, we eliminated manual measurement and documentation by enabling users to **mark defects directly in the CAD model**.

- ☑ **Faster processing**
- ☑ **More comprehensive information gathering**
- ☑ **In-depth defect data analysis**