PRESS RELEASE

Fraunhofer Vision at Control 2023
May 9th – 12th, 2023 in Stuttgart, Hall 7, Booth 7301

Acoustic monitoring for production

Short text

Fraunhofer IDMT presents a method for acoustic quality assurance based on sound analysis and artificial intelligence, which can provide a profitable supplement to optical testing methods when they reach their limits. Possible areas for the use of acoustic methods include the monitoring of welding or machining processes. At the booth at Control 2023, the method will be demonstrated using an air field hockey table on which three visually indistinguishable pucks made of different materials can be distinguished by the mere sound when they hit the board.

Long form

Acoustic monitoring for production

At Control 2023, the Fraunhofer Institute for Digital Media Technology IDMT, Ilmenau, Germany, will present a method for acoustic quality assurance based on sound analysis and artificial intelligence, which can provide a profitable addition to optical testing methods when these reach their limits.

Ensure quality, stabilize processes, understand artificial intelligence

AI-based acoustic monitoring (amo) can provide great added value in process monitoring, in-line and end-of-line product quality control, as well as predictive maintenance applications. In production, problems regarding unexpected machine downtime, production of poor or destroyed products, and low automation rates can be solved by using amo.
The goals of acoustic monitoring are the optimization of the user's production, stabilizing processes, avoiding recourse, and reducing faulty production.

AI hears and classifies errors correctly

The successful use of the innovative test method has already been demonstrated in the inline quality control of weld seams. Research is currently being conducted into approaches for monitoring different manufacturing processes, including those from the

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fields of welding and machining. Expert knowledge on suitable sensor setups, sensor data fusion, the processing of sensor data without connection to an external cloud, and energy-efficient AI models play a significant role in all targeted approaches.

Principle demonstrator for acoustic event detection (AED)

The new acoustic monitoring system will be demonstrated at the Control booth using an air hockey table. Three pucks are used, which are made of different materials and cause different "pling" sounds as soon as they hit the border of the game device. During play, these acoustic signals occur frequently and irregularly and can be analyzed and classified using machine learning techniques, even in acoustically challenging environments.

Images in print quality

Image 1: (fraunhofer-vision-control-2023-idmt-akustisches-monitoring-bild1.jpg) Tested in the lab: The fact the monitoring of welding processes based on noise emission and AI models works was proven in the project "AKoS - Acoustic control of welds in safety-critical components as part of quality assurance". (Source: Fraunhofer IDMT)

Image 2: (fraunhofer-vision-control-2023-idmt-akustisches-monitoring-bild2.jpg) Process monitoring in machining (symbolic image): Specialized personnel sees great potential in being able to draw conclusions about both the quality of the component, the clamping of the workpiece, the quality of the tool and machine faults just from the perceived, acoustic stimuli. (Source: Fraunhofer IDMT)

Image 3: (fraunhofer-vision-control-2023-idmt-akustisches-monitoring-bild3.jpg) The acoustic events in the game occur irregularly, very quickly, with a short duration and a spatial distribution - ideal for analysis using machine learning methods. (Source: Fraunhofer IDMT)

Exhibition dates

Control 2023 in Stuttgart
May 9th – 12th 2023
Hall 7, 7301

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