IDMT

FRAUNHOFER INSTITUTE FOR DIGITAL MEDIA TECHNOLOGY IDMT

PRESS RELEASE

## Hannover Messe 2023: Fraunhofer IDMT from Ilmenau shows reliable system for non-contact acoustic monitoring for production

The Fraunhofer Institute for Digital Media Technology IDMT will present a novel monitoring method for industrial production at the most important international industrial trade fair from April 17 to 21, 2023 in Hannover. At the booth of the Fraunhofer-Gesellschaft (Hall 16, Booth A12), the Ilmenau-based research institute invites all visitors to test the reliability of the acoustic monitoring method for themselves at an interactive demonstrator. Based on artificial intelligence (AI), acoustic monitoring can be used for the quality assurance of products and the optimization of processes along the entire value chain.

This year, the researchers at Fraunhofer IDMT chose a special demonstrator. Unlike classic industrial exhibits, the Fraunhofer IDMT Ilmenau booth is all about sport, fun and interaction.

Air-hockey table as principle demonstrator for acoustic monitoring
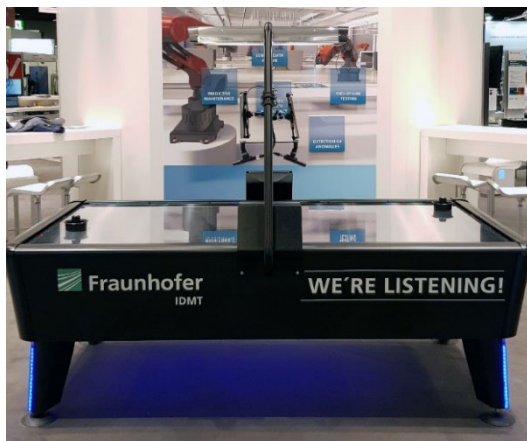
Visitors can play air-hockey and see how acoustic event detection can work in a real environment - based on air-borne sound analysis in combination with machine learning methods.

Pucks made from different materials are recognized based on their typical sounds during the game - in real time and robust against background noise.

Picture 1:
Fraunhofer IDMT Ilmenau's air field hockey table demonstrates at the Hannover Messe how acoustic event detection can work in a real-world environment. (Copyright Fraunhofer IDMT)

Press and Public Relation
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Project manager Peter Hofmann explains the idea behind the unique exhibit: "Our air-hockey table is a principle demonstrator. We are using our table to demonstrate the potential of acoustic monitoring for production. Within production environments, we encounter a wide variety of soundscapes composed of machine noise, process noise and other interfering sounds. The challenge for us is to "pick out" the specific acoustic events from challenging soundscapes and analyze them reliably. Our demonstrator recognizes these specific acoustic events - in this case the different pucks - very reliably thanks to machine learning methods. The acoustic distinction of the pucks' different materials demonstrates the automated detection of predefined classes, i. e., error patterns or states."
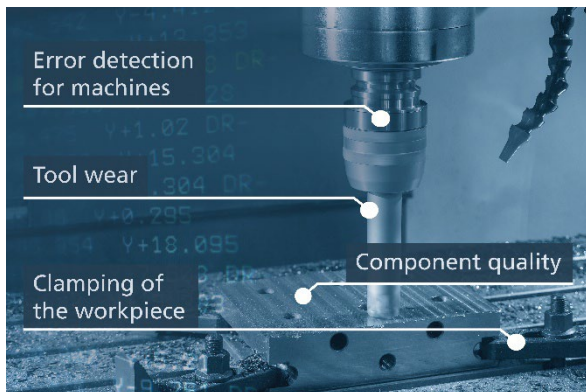
Avoid machine downtime and bad product quality

Picture 2:
For common individual problem analyses, such as incorrect machine settings, clamping of workpieces or tool wear, the technical staff uses acoustic signals to identify faults. (Copyright: iStock.com/Phuchit)

What will be presented as a hands-on exhibit at Hannover Messe is designed to help avoid problems with unexpected machine downtime and bad-quality or destroyed products in real production and manufacturing environments. Production efficiency can be increased, and costs can be reduced through acoustic monitoring.

An additional added value is that contact-free acoustic monitoring can be used where others, such as optical monitoring methods, reach their limits. AI-based industrial sound analysis can be used along the entire manufacturing chain: from process monitoring, in-line and end-of-line quality control of products, to predictive maintenance of machinery.

The research and development work incorporates the long-standing and internationally recognized expertise in the fields of acoustic measurement technology and AI-based audio signal analysis of Fraunhofer IDMT Ilmenau.

Visit our experts for industrial sound analysis at the Fraunhofer booth A12 in hall 16 and test our acoustic detection accuracy with a game of air-hockey!

About the Fraunhofer Institute for Digital Media Technology IDMT

Fraunhofer IDMT is headquartered in Ilmenau, Germany. The institute is internationally recognized for its expertise in applied electroacoustics and audio engineering, AI-based signal analysis and machine learning, and data privacy and security.

At the headquarters, on the campus of "Technische Universität Ilmenau" researchers work on technologies for robust, trustworthy AI-based analysis and classification of audio and video data. These are used, among other things, to monitor industrial production processes, but also in traffic monitoring or in the media context, for example when it comes to automatic metadata extraction and audio manipulation detection. Another focus is the development of algorithms for the areas of virtual product development, intelligent actuator-sensor systems and audio for the automotive sector.