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FRAUNHOFER INSTITUTE FOR DIGITAL MEDIA TECHNOLOGY IDMT

PRESS RELEASE

Fraunhofer IDMT presents method for airborne-sound based quality assurance at Hannover Messe 2018

On April 23-27, Fraunhofer Institute for Digital media technology IDMT will be demonstrating a method for acoustic condition monitoring and quality assurance (Fraunhofer Booth C22, Hall 2). The method allows continuous monitoring of industrial production lines as well as product quality control. It thereby helps reduce machine downtime and scrap.

The combination of intelligent acoustic sensor technology with secure and reliable data processing has the potential to revolutionize automated process control and quality assurance. For the development of the method, the researchers from Fraunhofer IDMT have leveraged their skills and expertise from three different areas: robust sound recording over microphones, automatic audio signal analysis, and machine learning.

Retrofitting solution for contactless, non-destructive quality control

This integrated approach brings about three major benefits:

- defective parts or components can be detected simply by their sound; traditional quality assessment requiring the destruction of randomly selected parts and components (to check welding seams, for example) can thereby be replaced with non-destructive testing;
- processes and products can be inspected from a certain distance, as no direct contact with machines or parts/components is required;
- the method can easily be integrated in existing production facilities and testing procedures.

At Hannover Messe 2018, Fraunhofer IDMT will be showcasing a new, interactive demonstrator illustrating the high-performance method. To develop this demonstrator, the researchers from Ilmenau teamed up with their colleagues from Fraunhofer IWS (Institute for Materials and Beam Technology, Dortmund).

Interactive and entertaining demonstrator

The team of researchers used RAVENSBURGER's GraviTrax®, an entertaining ball run (marble run) system, and coated one track segment and a number of metal balls with a diamond-like carbon coating, called Diamor®. This carbon film is typically used to coat ball bearings in industrial applications in order to extend their service life. At the booth, visitors may set in motion different balls – uncoated balls, balls coated with a polished Diamor® film, balls coated with an unpolished Diamor® film, and defective balls.

Editorial notes
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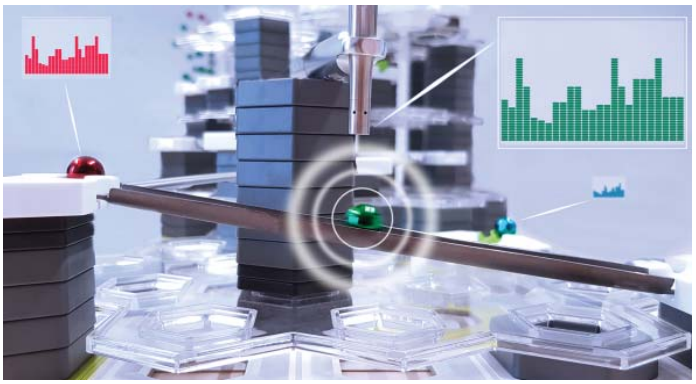
As soon as the coated balls roll down the coated track segment, the airborne-sound based analysis sets in to identify the material, the surface of the balls, and possible defects. The results of the analysis are displayed on a screen.

Judith Liebetrau, project manager at Fraunhofer IDMT, explains the idea behind the demonstrator: "What we will be demonstrating at Hannover Messe is one possible application – acoustic monitoring for quality control in the process of refining metal parts. As our method works contact-free, it is perfectly suited for acoustic inspection of moving parts, such as ball bearings."

Fraunhofer IDMT's new business unit 'Industrial Media Applications (IMA)' leverages the expertise from many years of applied research in four domains: intelligent acoustic measurement technology, audiovisual signal analysis, machine learning, and safety and security technologies. IMA thereby produces new solutions for being applied in industrial settings.

Visit us at the Fraunhofer Booth C22 in Hall2 – and get to know our method for acoustic condition monitoring and quality assurance of processes and products.



At the push of the button, the differently coated balls are released from the start ramp to take different ways to the target point being monitored acoustically.
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The **Fraunhofer Institute for Digital Media Technology IDMT** is doing applied research in the field of audiovisual media. The Institute is known as a competent partner of industry when it comes to developing groundbreaking technologies for the digital media domain. Together with its contracting partners Fraunhofer IDMT develops cutting-edge solutions consistently designed to meet user requirements and expectations. At its headquarters in Ilmenau and its branch in Oldenburg Fraunhofer IDMT employs over one-hundred people working on the Institute's research portfolio.

The **Fraunhofer-Gesellschaft** is the leading organization for applied research in Europe. Its research activities are conducted by 72 institutes and research units at locations throughout Germany. The Fraunhofer-Gesellschaft employs a staff of more than 25,000, who work with an annual research budget totaling 2.3 billion euros. Of this sum, almost 2 billion euros is generated through contract research. Around 70 percent of the Fraunhofer-Gesellschaft's contract research revenue is derived from contracts with industry and from publicly financed research projects. International collaborations with excellent research partners and innovative companies around the world ensure direct access to regions of the greatest importance to present and future scientific progress and economic development.