PRESS RELEASE

»Baden-Württemberg AI innovation competition«

Fraunhofer IPM involved in three competitive projects

As part of its AI innovation competition, the state of Baden-Württemberg is supporting a total of 44 projects from SMEs, with the goal of overcoming technical obstacles to the commercialization of artificial intelligence (AI). Fraunhofer IPM serves as a research partner for three of these projects.

The use of artificial intelligence opens up a broad range of innovative new business models for industry. To ensure that SMEs can benefit from these extraordinary opportunities, the state of Baden-Württemberg is promoting a total of 44 projects through its AI innovation competition. Fraunhofer IPM is contributing its expertise to the HOLO-KI, 3D-Hydra and GOSAIFE projects. The HOLO-KI project aims to develop AI-based quality control for high-precision turned parts. 3D-Hydra focuses on producing high-resolution flooding calculations using AI-based 3D-object detection in drone data. As part of the GOSAIFE project, Fraunhofer IPM hopes to be able to offer AI-based dynamic safety information for navigation systems in the future.

HOLO-KI: Artificial intelligence in quality control

When implemented in quality assurance, AI can take data interpretation in manufacturing to the next level. To this end, the HOLO-KI project seeks to augment the world's most accurate optical 3D inline measurement system for full-surface inspection of macroscopic precision surfaces at one-second intervals with an AI-based component classification. The development project will be implemented under real manufacturing conditions at Werner Gießler GmbH in Elzach, Germany. With its highly automated series production of more than 10 million precision turned parts each year at one-second intervals, the company is the perfect place to implement the AI project. The project relies on measurement technology to prevent slippage combined with AI-based data interpretation to prevent pseudo errors. By demonstrating that effective and error-free quality assurance for mass-produced, high-quality components is possible, it can serve as a beacon for future projects.

3D-Hydra: Improved assessment of flooding risk thanks to AI-based evaluation of drone data

Protective concepts used to assess the risks of extreme weather conditions are based on image data, which is typically gathered using aerial cameras. Currently, simulations are conducted in half-meter sections, which fail to capture the microstructure of the terrain. The 3D-Hydra project uses AI-based algorithms in a streamlined 3D model to transfer, analyze and semantically enrich high-resolution drone data. Typical urban objects such as walls, curbstones, façades and underpasses are automatically detected. Accurate to the nearest centimeter, this type of micro-3D model will serve as the basis for high-resolution flow simulation and flood risk maps.

GOSAIFE: AI-based safety assistant for navigation systems

The GOSAIFE project aims to develop navigation assistance that provides road users with information on potential road risks in real time. In the future, navigation systems will not just suggest the ideal route, but will also identify potential hazards and take them into account in routing and speed control. To make this possible, an artificial neural network (ANN) must be trained to recognize typical hazards in urban environments, such as road damage or specific types of buildings or intersections. The training relies on existing measurement data from various sources as well as synthetically generated data. An AI-based algorithm identifies the spatial and temporal relationships between the hazards and uses this to assign a risk classification, which is factored into the navigation application. In the long term, the data should originate from a wide range of data platforms. The project utilizes data from cargo bikes outfitted with cameras.

Further information

The HOLO-KI, GOSAIFE and 3D-Hydra projects are funded as part of an AI competition sponsored by the Baden-Württemberg Ministry of Economics, Employment and Housing. All three projects kicked off on January 1, 2021, and will run for 12 months.

HoloKI project partners

- Fraunhofer IPM – www.ipm.fraunhofer.de
- scitis.io GmbH – www.scitis.io
- Werner Gießler GmbH – www.werner-giessler.de

3D-Hydra project partners

- Fraunhofer IPM – www.ipm.fraunhofer.de
- svGeosolutions – www.svgeosolutions.de
- BIT Ingenieure – www.bit-ingenieure.de

GOISAIFE project partners

- Fraunhofer IPM – www.ipm.fraunhofer.de
- CARLA CARGO – Engineering GmbH – www.carlacargo.de
- inovex GmbH – www.inovex.de
- EDI GmbH – www.edi.gmbh/de

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Other contacts
Dr. Alexander Bertz | Group Manager Geometrical Inline Measurement Systems| Phone +49 761 8857-362 | alexander.bertz@ipm.fraunhofer.de
Prof. Christoph Müller | Group Manager Smart Data Processing and Visualization | Phone +49 761 8857-236 | christoph.mueller@ipm.fraunhofer.de
Fraunhofer Institute for Physical Measurement Techniques IPM | www.ipm.fraunhofer.de/en