

PRESS RELEASE

Artificial intelligence in the automotive industry

New software from Fraunhofer IGD accelerates and enhances sorting processes

The solution is right there in front of your eyes! ARRANGE software in combination with augmented reality (AR) glasses provides digital support for sorting processes. Employees on the production line see components that belong together overlaid in color directly in their field of vision. The innovative solution from Fraunhofer IGD is helping users in the automotive sector to reduce costs by accelerating processes and minimizing error rates.

Darmstadt: Red for order A, yellow for order B, green for order C... ARRANGE uses color coding to assist in the sorting of components. A prime example is sheet metal parts in the automotive industry, where solutions of this kind are particularly welcome. Using AR glasses, employees on the production line can see which customer the punched-out items are intended for. The potential of the software package from the Fraunhofer Institute for Computer Graphics Research IGD is especially apparent when applied to sheet metal consisting of up to a hundred elements.

ARRANGE works with purely synthetic data, i.e. it recognizes the real objects solely on the basis of 3D models of the parts. This solution shortens the learning process of the artificial intelligence enormously; up to now, real photographs were necessary.

Software performs target-actual comparison

ARRANGE offers users multiple benefits. The AI-based software increases the speed of the sorting process because the workers have the color-coded parts directly in their field of vision and no longer have to compare the sheet metal with images on an external display. "There is no need for abstraction, as the elements are directly overlaid in color," explains Fabian

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Rücker, a research assistant and doctoral student at Fraunhofer IGD. This reduces the susceptibility to errors in the sorting process. If an action is performed incorrectly, the software provides feedback.

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Equally relevant is the performance of a concomitant quality assurance task, namely target-actual comparison. If parts do not correspond to the 3D models visualized, for example because they are uneven or have a faulty shape, this also generates an error message. Taken together, the acceleration of the work steps and the minimization of errors help the industrial user to reduce costs.

Basic technology for full automation

Rücker developed ARRANGE with his team as part of a Software Campus project which received funding of 100,000 euros from the German Federal Ministry of Education and Research. He was given the opportunity to design his own research project in a leading capacity together with a well-known tool manufacturer and automotive supplier as industrial partner.

Further solutions have already emerged from the ARRANGE project, such as the MARQUIS software package from Fraunhofer IGD which additionally recognizes complex three-dimensional objects such as brake calipers as well as flexible parts such as hoses. "This technology is a step toward automation," explains Rücker. "It can be combined with robotic applications in the future."

Further information:

<https://www.igd.fraunhofer.de/en/products/automotive/accelerated-sorting-processes-thanks-to-ar-and-ai.html>

For more information on the ARRANGE Software Campus project, click here:

<https://softwarecampus.de/en/project/arrange-classification-pose-determination-and-tracking-of-industrial-objects-to-support-sorting-work/>

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Image (M): Fraunhofer IGD's AR software ARRANGE supports the sorting process with color overlays.
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About Fraunhofer IGD

Since 1987, the Fraunhofer Institute for Computer Graphics Research IGD has been setting international standards for applied research in visual computing, the branch of computer science that deals with images and 3D models. We transform information into images as well as images into information, and we support industry and business in their strategic development. Keywords here are human-machine interaction, virtual and augmented reality, artificial intelligence, interactive simulation, modeling, 3D printing and 3D scanning. Around 180 research staff at the three sites in Darmstadt, Rostock and Kiel are generating new technological application solutions and prototypes for Industry 4.0, digital healthcare and the smart city. Our products take on international relevance through our partnership with the sister institute in Graz and Klagenfurt. Our matrix organization enables us to serve our clientele from a wide range of industries with technical and competitive services relevant to their needs. For this purpose, we have assembled cross-functional teams of experts with extensive industry experience, who also take on planning, management and evaluation responsibilities for projects of any magnitude.