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Glass@Service – Keeping an eye on production

The Glass@Service joint project was launched in March 2016, funded by the German Federal Ministry for Economic Affairs and Energy (BMWi) as part of the “Smart Service Welt – Internetbasierte Dienste für die Wirtschaft” (Smart Service World – Internet-based Services for Business) technology competition. The goal of the project is to establish interactive personalized visualization within industrial processes by means of data glasses and other wearables using the “digital factory” in electronics fabrication as an example. A prototype of the data glasses that have been developed will now be debuted at the Fraunhofer FEP booth in the Organic and Printed Electronics Working Group (OE-A) Joint Booth No. 43164 during the Consumer Electronics Show (CES 2019) in Las Vegas, USA, from January 8–12, 2019.

Fabrication is becoming ever more complex, products ever more individualized, and processes ever more efficient – it is therefore not always easy for employees to maintain an overview in the increasingly automated 4-D networked environment that used to be called a workbench. However, these rapid changes and technological variants also offer many opportunities. Typically, information in fabrication processes is entered via buttons, keyboards or touch screens and displayed on screens of various types and sizes. In practice, however, this leads to the moving away of the user’s focus of attention from work towards the information system. This reduces efficiency, is not ergonomically optimal, and is also a potential source of error. By using data glasses equipped with transparent lenses, the required information can now be displayed directly in the working field of view, enabling a sequence of movements to be made more ergonomically.

What began in the 1980s as a revolution in the workplace through introduction of personal computers (PCs) might be repeated in the near future in the industrial, medical, transportation, and education and training sectors. The use of data glasses has the potential to replace today’s workstation computers and human-machine interfaces (monitors, mice, etc.) at manufacturing and service workplaces and to give users undreamt freedom in operations and mobility. They will have their hands free to carry out their work and always be well informed, while being mobile and connected.

The six project partners in the Glass@Service project, led by Siemens AG, are convinced that they have the technologies available to put Germany in pole position for delivering innovations in data glasses for industrial applications. With their know-how, they cover



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the entire spectrum of intelligent data glasses (smart glasses), novel interaction modes (for example eye and gesture control) and innovative IT services that will be optimally combined within the factory of the future.

“We would like to use these data glasses at Siemens, for example, in warehouse logistics and when setting up machines, and believe that this will reduce errors while making our work more comfortable and ergonomic”, explains Dr. Frank-Peter Schiefelbein of Siemens, coordinator of the joint project.

Data glasses are novel elements in visual human-machine interaction space. The system becomes intelligent when, in addition to image reproduction via miniaturized displays placed close to the eye, additional sensory capabilities are integrated.

The Fraunhofer FEP is developing the necessary intelligent OLED microdisplays that will then be integrated by UVEX Arbeitsschutz GmbH into data glasses optimized for work and controlled by optimized SIEMENS eyeglasses electronics. SIEMENS is preparing the existing IT infrastructure for integrating the new devices into and will ensure data security. DIOPTIC GmbH will provide the necessary optical modules.

UBIMAX GmbH is programming the appropriate software for each specific application – for example for the use of glasses in the areas of set up and commissioning. In order to create optimal working conditions for the users and thus achieve user acceptance of the new data glasses, expertise in ergonomic methods is being provided during the development process by the German Federal Institute for Occupational Safety and Health (Bundesanstalt für Arbeitsschutz- und Arbeitsmedizin/BAuA) also a project partner. This will involve evaluation of long-term use of data glasses under actual working conditions.

The project has produced a first prototype of data glasses for use in Industry 4.0. This will be presented along with other current demonstrators and research results from the Fraunhofer FEP during the Consumer Electronics Show 2019 (CES) in Las Vegas, USA, January 8–12, 2019.

The consortium would like to thank the Federal Ministry of Economics and Energy (BMWi) for funding the project as part of the “Smart Service Welt” initiative.

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Use case for data glasses in the work place of setting up a machine

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Fraunhofer FEP at the Consumer Electronics Show CES 2019:

Sands Expo

Las Vegas, USA

Organic and Printed Electronics Working Group (OE-A) Joint Booth No. 43164 in Sands Level 2, Halls A-D

Conference Talk:

Bernd Richter, "Innovative OLED Microdisplays for AR and VR Applications"

Conference track "Printed Electronics: Flexible, Lightweight, Smart"

Session: Connecting Objects, Homes and Cities

Tuesday, January 8, 2019, 15:30-16:30

North Hall, N 253, Las Vegas Convention Center

www.ces.tech/conference/Printed-Electronics.aspx

The **Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP** works on innovative solutions in the fields of vacuum coating, surface treatment as well as organic semiconductors. The core competences electron beam technology, sputtering and plasma-activated deposition, high-rate PECVD as well as technologies for the organic electronics and IC/system design provide a basis for these activities. Thus, Fraunhofer FEP offers a wide range of possibilities for research, development and pilot production, especially for the processing, sterilization, structuring and refining of surfaces as well as OLED microdisplays, organic and inorganic sensors, optical filters and flexible OLED lighting. Our aim is to seize the innovation potential of the electron beam, plasma technology and organic electronics for new production processes and devices and to make it available for our customers.