

PRESS RELEASE

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for immediate release

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18 May, 2019

Dr. Johannes Meyer receives EMVA Young Professional Award 2019

Copenhagen, 18 May, 2019. The EMVA Young Professional Award 2019 goes to Dr. Johannes Meyer, for his work “Light Field Methods for the Visual Inspection of Transparent Objects”. Johannes Meyer, age 31, received his Bachelor's and Master's degree in computer science from the Karlsruhe Institute of Technology KIT (Germany) in 2012, respectively, in 2014. He has been working as a research scientist in close cooperation between the Vision and Fusion Laboratory of the KIT and the Visual Inspection Systems department of the Fraunhofer-Institute of Optronics, System Technologies and Image Exploitation IOSB (Germany). In 2018, he obtained a PhD in computer science from the KIT. Since 2019 he is working for ITK Engineering GmbH in the field of computer vision.

Light Field Methods for the Visual Inspection of Transparent Objects

Objects made from transparent materials play crucial roles in humans' everyday life. They are employed, e.g., as windshields, glasses or as plastic lenses to guide laser beams in an eye surgery. Especially when considering the latter example, it is obvious, that such objects must meet high quality requirements. Hence, a visual inspection for material defects like enclosed air bubbles or surface scratches is inevitable. Human visual inspection is a fatiguing task which is not very robust and prone to subjective results or even to unrevealed defects. Automated visual inspection systems represent a reliable alternative to manual inspection. However, the automated inspection of complex-shaped

transparent objects like lenses, windshields etc. still represents a challenging task with several open research questions.

A transparent object itself and the material defects influence the direction of propagation of the transmitted light. Hence, the complete light field, i.e., the position and direction of propagation of the light rays, must be considered for the detection of defects. Accordingly, this thesis introduces methods based on the concept of light fields for all main components of a visual inspection system, the illumination source, the sensor device and the signal processing algorithms. A novel sensor system, the laser deflection scanner, allows to acquire high resolution light fields of transparent objects. By means of suitable processing algorithms, material defects can be extracted out of these light fields in real time. Furthermore, a method for inverse light field illumination has been developed, that suppresses all intended structures of the test objects and reveals material defects with high contrast. A thorough experimental evaluation stated the superiority of the introduced methods over the state of the art with respect to several criteria.

Young professional award part of EMVA Business Conference

The EMVA Young Professional Award is an annual award to honor the outstanding and innovative work of a student or a young professional in the field of machine vision or image processing. It is the goal of the European Machine Vision Association EMVA to further support innovation in the machine vision industry, to contribute to the important aspect of dedicated machine vision education and to provide a bridge between research and industry. With the annual Young Professional Award the EMVA intends to specifically encourage students to focus on challenges in the field of machine vision and to apply latest research results and findings in computer vision to the practical needs of the industry. The awardee was announced on May 18 during the 17th EMVA Business Conference in Copenhagen/Denmark, where he also had the opportunity to present his work as part of the regular conference program.

The 18th EMVA Business Conference will take place from 25–27 June, 2020 in Sofia, Bulgaria.

Photo: EMVA Young Professional Award Winner Dr. Johannes Meyer (left), EMVA President Jochem Herrmann; Picture source: EMVA

About EMVA:

Founded in May 2003 in Barcelona, the European Machine Vision Association currently has about 120+ members representing more than 20 nations. Its aim is to promote the development and use of machine vision technology and to support the interests of its members - machine vision companies, research institutions and national machine vision associations. The main fields of work of EMVA are: standardization, statistics, the annual EMVA Business Conference and other networking events, European research funding, public relations and marketing. To find out more visit the web site www.emva.org.