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Development of an assistance system for a laser-based dry pretreatment plant

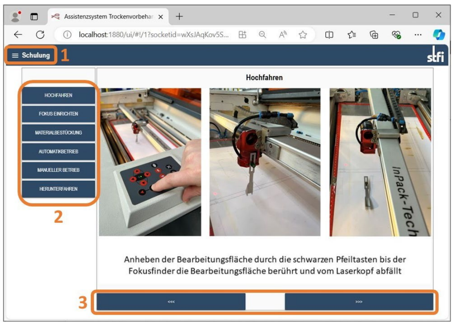
Objective

Established wet-chemical textile finishing processes require drying energy, chemicals, water and measures for their preparation. Laser-based dry pretreatment offers an energy- and resource-saving alternative, but is not yet established on an industrial scale and has not yet been included in textile education. Considering the advantages of this technology, this project aims to promote the integration of laser-based dry pretreatment in textile finishing. A support system has been developed to facilitate the operation of the system and to promote understanding of the process.

Approach and results

The development of the assistance system was based on a comprehensive needs analysis that focussed in particular on the operators of the system and incorporated their previous experience. The result of this analysis was a focus on systematic knowledge and skills in handling the system, which were documented in a specification sheet together with system-specific boundary conditions. Based on this, the concept of the assistance system was developed, which included process understanding, familiarisation with the new process and operation of the system.

Dry pretreatment plant at STFI



Dashboard of the assistance system: (1) Area, (2)Task, (3) Navigation

As part of this, empirical knowledge and machine data were taken into account in real time to ensure a high level of accuracy and efficiency. The versatile information technology system Node-RED was selected to realise the innovative concept due to its flexibility and wide range of integration options. In addition to creating the required learning content, a user-friendly and intuitive interface for mobile machine data display was seamlessly integrated, enabling real-time monitoring and analysis.

The prototype of the application was thoroughly tested for its practical suitability in comprehensive user tests.

INNO-KOM

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The final report on this project is available on request.

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