Interdisciplinary Project (IDP):

Industry 4.0 - Automated positioning of virtual resources through image recognition

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Description:
Simulation models represent a suitable tool in the planning and verification of production processes and serve, among other things, as decision support. For several years now, the iwb has been dealing with topics in the field of communication between components of a production system as well as simulation and information models (cyber-physical systems).

In order to fulfill individual process requirements of the products, operating must be exchanged, added or removed (reconfigurable production systems). This approach, also known as Plug&Produce, requires a high level of hardware abstraction at the communication level in order to exchange components from different manufacturers.

The decisive factor for reconfigurable production systems is that the simulation models are up-to-date and show as few deviations as possible from the production system. The determination of the position and orientation of new operating resources in the plant represents a challenge. Within the scope of this IDP, the automated positioning of components in simulation models is to be made possible by means of image recognition.

In this context, image recognition approaches can be used which enable in the future the automatic adaptation and updating of simulation models.

Accompanying Course/Lecture:

The lecture "Intelligent Networked Production - Industry 4.0" with the corresponding exercise is recommended as an accompanying course. The lecture gives an overview of information technology systems in the production environment, picks up on current trends in the automation of planning tasks and at field device level and thus draws a broad framework around the politically coined term "Industry 4.0". Concrete contents of the lecture are, for example, ERP and PPS systems, CNC and SPS controls or industrial communication standards as well as plant simulation. These topics will be examined in more detail in the corresponding exercise. The lecture also includes an excursion to the experimental field of the Fraunhofer IGCV in Augsburg. There, demonstrators of current research projects will be presented and a simulation game will be conducted with the students.