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Process Optimization in Real-Time

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Design of Experiments (DoE) is a systematic procedure for planning and performing tests as well as subsequently analyzing the results to optimize production processes. The methods of experimental design, however, are deployed detached from the regular manufacturing processes and thus their deployment requires quite an extra effort. To avoid this extra effort a methodology is needed which is capable to optimize the manufacturing process in real-time during production.
Therefore, the universally usable and flexible toolkit *EmbeddedDoE* is being developed, which meets these requirements and consequently enables especially small and medium enterprises (SMEs) to integrate Industry 4.0 in a simple and uncomplicated way in their production. The optimization will be accomplished by regularly recording data like process parameters, influence factors or quality characteristics along with a product-ID using various types of sensors from the running production process in a first step (see also figure 1). In a second step, using appropriate algorithms, the data are analyzed and a new set of process parameters is generated aiming towards an optimum performance of the process. Improvements will continue until the optimum performance capable by the process is reached.