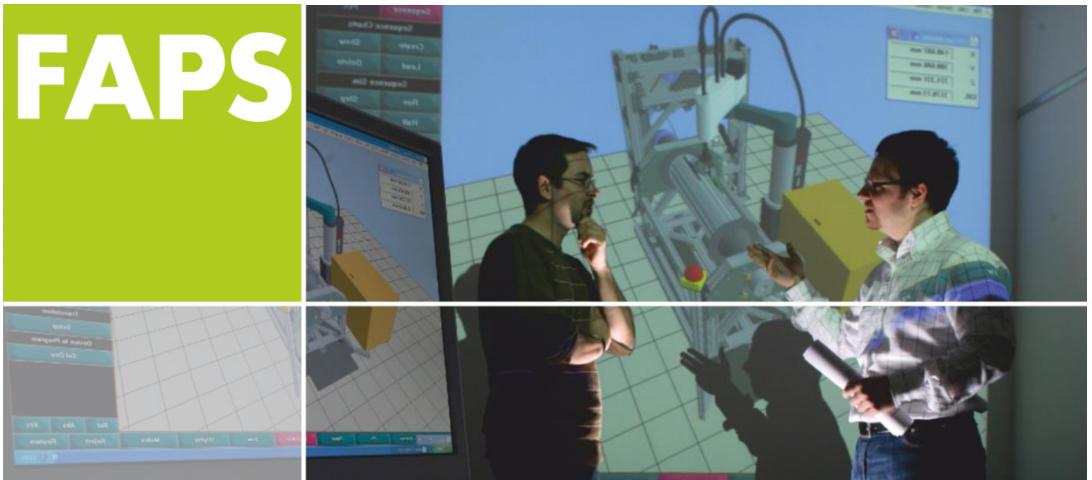


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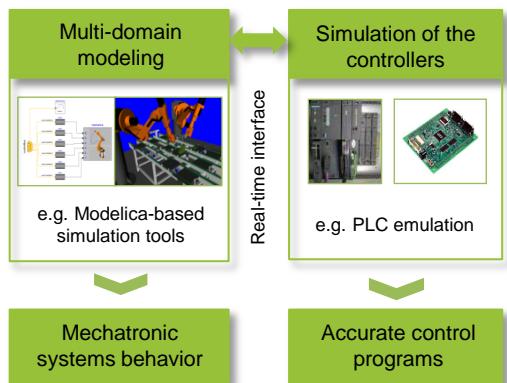


Modeling of Mechatronic Systems

Mechatronics Behavior Analysis for the Development of Assembly System Components

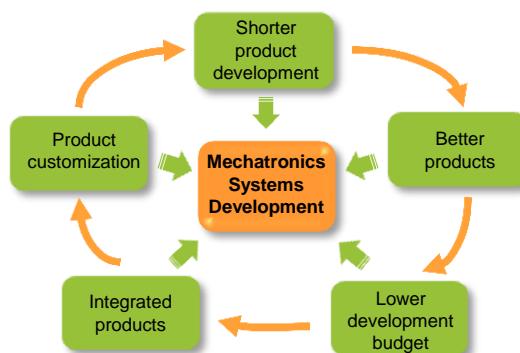
Paryanto, M.T.

An assembly system component, such as an industrial robot, conveyor systems, or a linear axis is a complex mechatronics system, which consists of mechanical, electrical and automation systems. Therefore, the development and the parameter optimization of these products are a complex task with many obstacles. Furthermore, the number of mechatronics product variants increase continuously. The need of product customization also pushes the manufacturing industry to search for an effective and efficient development method. In most of the cases, the simulation approach can be used effectively for developing, analyzing, and optimizing the assembly system components. However, these simulation approaches are often not well integrated and usually divided into control system simulation, kinematic simulation, dynamic simulation and physical simulation. This condition leads to the development process time consuming, cost intensive, and resulting in lower product accuracy.



An integrated simulation approach to the development of assembly system

To solve these issues an integrated simulation method using multi-domain simulation tools to analyze and optimize the mechatronic behavior of the assembly system components has been developed. The mechatronics behavior, such as dynamic behavior, electrical behavior, and pneumatic behavior is the key factor to improve performance of the mechatronics product. Using this method, all of these behaviors can be analyzed and optimized in one work package.



The requirement of the development of new mechatronic products

The integrated simulation method allows the evaluation of the mechatronic behavior and control design in a short period and gives a higher confidence at an early stage of the development process. Moreover, by using the integrated simulation approach, each component of complex assembly systems can be designed, analyzed, optimized and tested without even having a complete real construction.