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Industry 4.0, robotics and automation in the production environment: Future trends and challenges in product design

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Together with the digitalization, the frames for product design are changing substantial. Tools for simulation and digital twin representations now can be connected directly with the CAD systems. This means that the optimization of the product or the mechanical solution now can be handled in a multi objective system involving performance, reliability, production technologies and value chain analysis. A very important feature is the possibility of including systematic performance studies of the use of the product or mechanical solution. This can be done still by empirically means, but due to the digitalization, also using systematic sensor input. This enables the possibility of a more user-oriented perspective in the design, but also that the design can be defined in a more open manner, where the customer by digital tools can define some free elements and functionalities within a given frame of design freedom. To realize these new possibilities a more flexible and agile production system is required. In this sense the number of robot, flexible production units and new digitalized technologies are introduced in the production environments. This leads off cause to a higher degree of flexibility, but also a need for planning and control to obtain an economic feasible productivity. For many industrial CEO's there is a big challenge in finding the right strategy and track in the world of digitalization to balance the cost and productivity with the ability to act agile and in harmony when new marked possibilities occur. The business strategy and strategy for optimizing of products and production setup is getting more complex and specific for the individual company. The challenge is to find some generic tools or methods to support this development.

Biography

Martin Heide Jørgensen is a Program Coordinator I4.0 since 2017 at University of Southern Denmark, The Maersk Mc-Kinney Moller Institute. He had completed his PhD from Aalborg University in the area of Fracture Mechanics. Later, he has contested different jobs, all in the area of public research and education, including a period of 7 years as Head of Department at Aalborg University. Within the last 3-4 years, his research area has been digitalization and I4.0.

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