

# Production and Operations Management

A Research Field at FH Upper Austria Steyr Campus

## Research Topics

- » Optimization of production planning and production control
- » Optimization of production processes
- » Assistance systems for industrial processes
- » Business analytics

The focus of this research department is the more efficient design of production processes. Specifically, possibilities for inventory reduction, transit time reduction and increase in delivery reliability are developed. In the area of production planning and control, existing systems and newly developed concepts are examined, evaluated and compared. Self-developed simulation models help to analyse connections between external influences or disturbances and target characteristics in complex production systems. As a new process for efficient and ergonomically correct design of assembly processes in the planning phase, virtual and mixed reality is applied and further developed. Regarding the development phase this tool allows the number of prototypes to be significantly reduced by means of tests on digital prototypes.

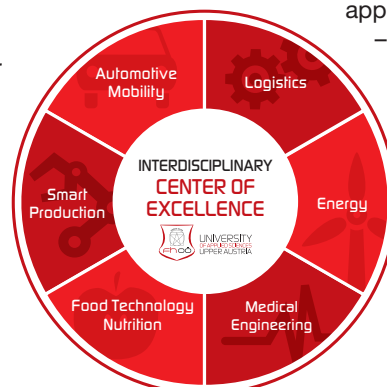
## Flagship Projects

### SimGenOpt II: Integrated Methods for Robust Production Planning and Control

SimGen, a simulation generator developed in the field of research, integrates and analyses production processes, including the planning and control of various companies. The digital image of the production company resulting from this is, as in the real enterprise, controlled by widespread planning methods, such as material requirements planning (MRP), and coordinated in such a way that the real and virtual company numbers are the same. By means of the optimization environment HeuristicLab, developed by FH Upper Austria Hagenberg Campus, the planning parameters with regard to cost efficiency and delivery reliability are improved through the use of simulation-based optimization. The optimization allows a compromise between cost-efficient and stable or robust parameters. Knowledge about the evaluation of stability and robustness during optimization is gained and new methods for optimization are developed. Project management is carried out at FH Upper Austria Hagenberg Campus.

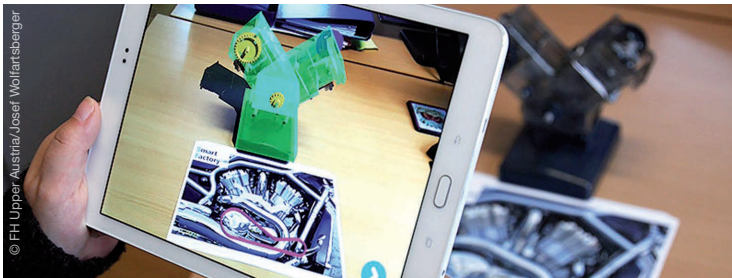
### Centre of Excellence for Smart Production

As an innovative partner to the economy, the centre has specialized in research and transfer on the subject of smart production. By coordinating and cross-linking all relevant disciplines – distributed intelligence, modelling, simulation and optimization approaches and 3D printing / rapid prototyping – a lively exchange of information between Campuses Steyr, Hagenberg and Wels of FH Upper Austria is made possible both in research and in teaching.



## Smart Factory Lab: Mixed Reality Assistance System for Industry 4.0

The complexity of production increases as a result of increasing individualization. The development moves towards the production of small lot sizes. Employees have an ongoing need for information, for example in assembly. Augmented reality (AR) and virtual reality (VR) technologies provide valuable support to minimize error rates and increase turnaround times. At Steyr Campus, the possibilities of AR and VR are being researched. This helps the employees in various areas of production by means of context-related assistance. For this purpose, several application scenarios are developed in a laboratory environment and are prototypically implemented and evaluated together with company partners.



## Maturity Model Industry 4.0

To remain competitive in the global marketplace, digitization of the value chain and industry 4.0 have become essential components for every (production) company. The developed maturity model is used to measure this industrial 4.0 maturity. The dimensions of data, intelligence and digital transformation are used to measure the maturity of a company in relation to industry 4.0. In addition, companies are supported in finding and realizing potential for improvement.

## HCW4I: Human Centered Workplace 4 Industry

The three FH Upper Austria Campuses Wels, Hagenberg and Steyr design universal methods and systems for the digital assistance of production workers at the workplace. Thus they ensure a safe interaction of man and machine with sensor-based situation and status recording. These training and assistance measures for increasing quality and efficiency down to the smallest lot sizes range from product-specific work instructions on a screen, via augmented reality systems to collaborative robots at the workplace. The project management is carried out at Wels Campus.

## MCRP: Material and Capacity Requirements Planning

An approach for the integration of capacity planning into the MRP run (MCRP) is investigated. The already published basic concept is further developed with respect to mathematical-analytical as well as algorithmic modelling for its better integration into the standard MRP run and evaluated with the aid of simulation.



Check this out:  
[forschung.fh-ooe.at/en/fe-pom](https://forschung.fh-ooe.at/en/fe-pom)



## Research & Development at FH Upper Austria



More than **440 researchers** at FH Upper Austria use their expertise within **17 thematic areas**.

A total of **€ 17,34 million** of research funding is available per year, with almost **350 ongoing national and international projects** being financed.



We cooperate with about **630 partners** from industry and business.

## Take a look at ...



Prof. DI Dr. Herbert Jodlbauer talking about Production and Operations Management:  
[www.youtube.com](https://www.youtube.com)

## Contact

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