

JOANNEUM  
RESEARCH



# *The Future of Production*



THE INNOVATION COMPANY

# JOANNEUM RESEARCH's Key Activities

The production of goods represents a fundamental pillar of European prosperity and competitiveness in a global market. In order to protect the region's economy, substantial advances ranging from increased digitalization to optimization in the sense of a functioning low CO<sub>2</sub> circular economy in production processes are necessary.

At JOANNEUM RESEARCH, more than **250 interdisciplinary experts** work in the area of »**Information and Production Technologies**« for national and international clients and together with partners in the following areas of research:

- **Digitalization in production**
- **Optimization of production technologies and processes**
- **Climate-neutral production**

JOANNEUM RESEARCH's contribution can range from initial analyses and feasibility studies up to the development of industrial solutions for quality assurance systems, production processes and technologies, materials and the analysis of industrial production data, depending on the area of application.

Our research infrastructure is aligned with the needs of business and industry. Access to state-of-the-art international technological developments is ensured thanks to the close cooperation with leading international research facilities.

## Digitalization in Production

Digital innovation is a development driver: it changes existing production processes and methods while enabling new ones. Powerful sensors provide a wealth of data that can be used for automation, optimization and quality assurance purposes through the application of modern information processing techniques and artificial intelligence. Furthermore, modern robotic technologies enable the digital value addition chain to be connected to the physical world of production in a cost-effective and quality assuring manner.

### Areas of Research:

- Optical and acoustic test procedures for product and process quality assurance in an industrial setting
- Multi-sensor monitoring system for automated operation
- Real-time Industrial-Internet-of-Things (IIoT) to network the production machine park
- Robots used as tools for digitalization and quality assurance
- Design and validation of robot-based production processes
- Investigation and test of physical and cyberphysical safety in automated production systems
- Data analysis for the predictive maintenance and optimization of tool use

## Optimization of Production Technologies and Processes

The development of new machines, software systems and materials has provided the technological basis for an economically justifiable optimization of new and existing manufacturing technologies and processes. JOANNEUM RESEARCH helps business and industry take advantage of these opportunities by providing holistic support in the areas of research, development and implementation.

### Areas of Research:

- Generative manufacturing (laser production technology, 3D printing, plasma technologies)
- Optics-Design, optical simulation, analysis and manufacturing of optical systems and micro-optical elements
- Structuring processes (e.g. lithography, ion-etching)
- Roll-to-roll-nano-imprint process
- Coating processes (e.g. ink-jet, aerosol-jet printing)
- Implementation of Robot-supported optimized processes
- Prototyping using hands-on process development and validation

## Climate-Neutral Manufacturing

The internationally agreed climate goals provide many opportunities for the European manufacturing industry during their transition to climate-neutral production. This requires the best possible balancing of resource use, environmental impact and economic viability. It is also essential to perform macro-economic analyses to safeguard both existing and newly established production locations and to consider increasing climatic risk in global value chains.

### Areas of Research:

- Lifecycle analyses for production processes and products
- Integration of lifecycle data in industrial digital data streams
- Climate risk analyses in the global value chain
- Macro-economic modelling of production processes in international competition

For further information,  
please follow the link:

[www.joanneum.at/en/get-to-know-us/  
future-production](http://www.joanneum.at/en/get-to-know-us/future-production)



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