

Media Information
21 July 2026

BMW Group Plant Landshut develops software for humanoid robotics in component production.

+++ Focus on software stack development, linking data, robotics and applications in component production +++
Project supported by partners from academia and industry
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Landshut. The BMW Group is expanding its expertise in the field of physical AI, with BMW Group Plant Landshut taking on central software development tasks for AI-supported robotics in component production. The focus is on open software platforms, the generation, provision and processing of training data, simulation and motion planning, as well as the training of robotic systems. These activities complement the pilot projects already underway exploring the use of humanoid robotics at Plants Leipzig and Spartanburg.

Landshut is leveraging its role as a centre of expertise for in-house component production. The wide range of products and manufacturing processes provides ideal conditions for developing and evaluating new approaches using AI-supported robotics under real-world production conditions. At the heart of these activities is the question of which tasks will be suited to humanoid robotic systems in the future – particularly where flexibility, fine motor skills and an understanding of the working environment are required. For this purpose, Plant Landshut is developing software that enables robots to perceive their environment, evaluate situations and derive appropriate actions independently.

“At BMW Group Plant Landshut, we are combining software expertise with industrial practice in our component production. This allows us to test new technologies at an early stage and carefully evaluate their benefits for production,” says **Dr Wolfgang Bluemelhuber, head of Driving Dynamics and In-house Component Manufacturing.**

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Media Information

Date 21 July 2026

Subject BMW Group Plant Landshut develops software for humanoid robotics in component production.

Page 2

Technological foundations for AI-supported robotic systems

The starting point is further development of the software architecture. At its Landshut facility, the BMW Group relies on open platforms that enable the flexible and scalable training of robots by combining traditional (deterministic) programming with modern AI models (Vision-Language-Action (VLA) models), integrating visual information, language comprehension and robot actions. The goal is a modular robotics ecosystem in which diverse systems work together. This creates a technical basis for new functionality and a wide variety of industrial applications.

This requires reliable data. At Plant Landshut, the project team captures data from real production environments and test setups, and integrates it into robot simulations, in which movement patterns and motion planning are modelled virtually. This enables processes to be tested in advance and learning processes to be accelerated. New approaches are initially trialled outside of ongoing production, implemented in pilot projects and then scaled up in stages.

In parallel, humanoid robotic systems acquire new skill sets through demonstration-based learning. In this process, movement patterns and work sequences are first demonstrated by the project team. The data generated in this way is collected by camera systems, motion capture suits and data gloves. It is then converted into generalisable behavioural models – known as policies – that can be applied to different tasks and use cases.

"For us, it is crucial to develop the technology in very close alignment with real-world requirements. We are not just testing what is technically possible, but also where humanoid robotics can truly deliver reliable benefits in component production. This gradually creates a clear picture of which applications are suitable for industrial use," says **Christoph Jagoda, the Physical AI project manager at BMW Group Plant Landshut.**

Media Information

Date

21 July 2026

Subject

BMW Group Plant Landshut develops software for humanoid robotics in component production.

Page

3

Potential uses in component production

On this basis, Plant Landshut is working on applications for humanoid robotics in component production. The focus is on tasks requiring a high degree of flexibility, fine-motor skills and a good understanding of objects and working environments. This includes recognising and interpreting environments, determining position and status, planning efficient movements, and precisely gripping and moving components.

To refine the basic technology, the BMW Group is working closely at its Landshut site with partners from industry and academia. This includes, in particular, direct cooperation with Athenyx Robotics, a startup founded specifically for this field of technology that originated at the Laboratory for Machine Tools and Production Engineering (WZL) at RWTH Aachen University and is located in close proximity to BMW Group Plant Landshut.

The tech company is developing AI-based software for intelligent robotic systems in conjunction with BMW Group specialists. The primary focus is on creating a so-called "intelligence stack" that integrates perception, learning, simulation and decision-making. The aim is to enable humanoid robots to perform complex tasks in industrial environments independently. This requires the systems to be able to perceive their environment, evaluate situations and derive appropriate actions accordingly. The platform-based approach means that acquired skills can be transferred across different robotic systems and use cases in the future.

In addition, Plant Landshut is collaborating with specialists the University of Applied Sciences Landshut – for example, on data generation, simulation and the development and testing of specific use cases.

Media Information

Date

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Subject

BMW Group Plant Landshut develops software for humanoid robotics in component production.

Page

4

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BMW Group Plant Landshut

Around 3,800 employees at BMW Group Plant Landshut produce engine, chassis and structural components made from light-alloy castings, electrical and electronic components, plastic components for vehicle exteriors, carbon body components, cockpit and interior equipment, engines and propeller shafts. Plant Landshut is the BMW Group's largest components plant worldwide and supplies all BMW Group vehicle and engine plants around the globe – and therefore virtually every vehicle from BMW, MINI, Rolls-Royce and BMW Motorrad. BMW Group Plant Landshut combines digitally enabled component production with a clear focus on sustainability and responsible resource use.

With forward-looking technologies, BMW Group Plant Landshut acts as a driver of innovation in the technological transformation of the automotive industry and its suppliers. At the plant's connected technology centre, specialists from a wide range of disciplines actively help shape the development of future vehicle generations. They are involved in the development processes of new vehicles at an early stage. In the Landshut region and in Lower Bavaria, BMW Group Plant Landshut is a socially committed, innovative and attractive employer.

www.bmw-werk-landshut.de