Project Results Summary: GANResilRob

GAN ResilRob

What results were achieved?

GANResilRob has developed an innovative framework for the automation of assembly and disassembly processes that offers a high level of resilience and flexibility in exceptional situations.

The system automatically analyses CAD models for suitable assembly steps and boundary conditions. In combination with robot capability descriptions and visual environment analysis, large-language and vision-language models generate situation-adapted robot programmes without manual programming. If conditions or capabilities change, the programmes can be adapted fully autonomously. This represents a new level of industrial autonomy – successfully demonstrated in two use cases: the assembly of a vacuum chamber and the disassembly of the battery of a heat cost allocator. The framework thus makes an important contribution to flexible, resilient production automation and opens up new perspectives for adaptive robot systems.

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"The pilot from GANResilRob shows great potential for increasing the efficiency of recycling processes. The automated removal of batteries and recyclable materials significantly increases the economic efficiency of the system. The use of AI achieves the flexibility that was previously the main hurdle."

Dr Phillip Wallat
Managing Director DfACE Strategy Systems

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Programm begleitung

DLR Projektträger

What is the benefit for the industry?

The framework enables rapid, resource-saving transfer to new products and areas of application, such as the recycling of disused smoke alarms. The generalised AI components can also be transferred to other automation contexts in the circular economy, such as inspection or remanufacturing. Companies benefit from reduced programming costs, shorter implementation times and flexible adaptation options in the event of changing production conditions.

What are further plans after the project ends?

The results will be incorporated into further research projects, particularly in connection with the development and utilisation of adaptive AI models. Sub-components are to be published under an open source licence. The aim is also to commercialise the results
– in cooperation with potential users
– in order to transfer the developed approaches into practical industrial projects.

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5 Partners

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