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Chair for Automated and Autonomous Systems
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ExpertSys – part of EVO-MTI

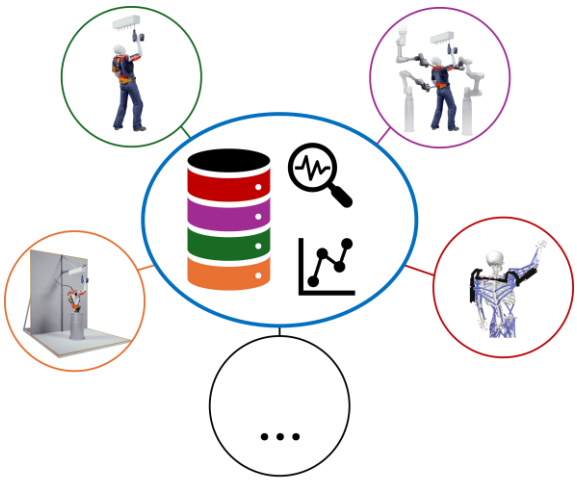
Development of an expert system for the design and evaluation of exoskeletons

BACKGROUND

Assistive technologies are being used in more and more life situations. One approach here is exoskeletons, which, depending on their design, are intended, for example, to relieve the strain on the workforce during physically demanding activities or to support users during rehabilitation. Corresponding systems must be designed with regard to the support situation - for example physio-logical requirements, movement sequences, intended use and general conditions. The development and evaluation process of corresponding systems is carried out using simulation, design and evaluation methods and tools, as well as on the basis of individual skills and experience. The overall EVO-MTI project is developing a digital environment for the design, evaluation and optimization of human-machine systems with humans in the power flow, human-technology interaction (HTI) and system components such as physical interfaces for power transmission.

FOCUS OF WORK

In EVO-MTI, the individual system components of the human-machine system are replaced and represented by different physical and simulation models. Accordingly, these different abstractions and models of the human, the exoskeleton and the activity provide a variety of different data and information. In this sub-project of EVO-MTI, a superordinate expert system is to be developed that allows this data to be analyzed and interpreted. Hence, this is used for the evaluation and design of systems. The basis for this is a fundamental system architecture for linking all the models, procedures and methods used, as well as the development of a database to securely compile the data and findings obtained in the project. This will enable a comprehensive and structured analysis of the human-machine system, providing valuable insights and recommendations for improvement. The expert system will be designed to be flexible and adaptable.



KEY MESSAGES

As part of the EVO-MTI sub-project, a superordinate expert system is being developed that combines and integrates the various information and data of the sub-aspects of the human-machine system. This represents a development tool that enables the derivation of design recommendations for exoskeletons. Ultimately, the expert system provides support for early evaluation.

Funding
Dtec.bw – Zentrum für Digitalisierungs- und Technologieforschung der Bundeswehr

Funding-ID
EVO-MTI - EU (NextGenerationEU)

Duration
04/2025 – 12/2025

Project partner
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