MECHATRONICS OF THE DLR

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This paper is a short presentation of actual application of mechatronic systems in DLR. The DLR Hand is a multisensory robothand with an extraordinary performance. It serves as a platform for the development of new strategies and algorithms for grasping and manipulation with anthropomorphic robot systems. A major step towards a universally applicable system was the integration of all motors, sensors, as well as power and communication electronics into the hand. Consequently, it can be mounted on any robotic arm or even be used standalone. Due to its extensive sensory equipment it enables the application of various new control strategies. Together with DLR's light-weight robot a unique and flexible platform is obtained applicable to any service task. In spite of its very high complexity, over the last years the DLR Hand has proven to be a robust robotic tool which is sensitive as well as powerful and fast.

Throughout the last three decades, robots were developed with increasing capabilities to perform tedious work in industrial environments more precisely than a human worker and without fatigue. Going beyond, in the last few years, researchers strove to also develop robots that can be applied outside the well structured, predictable surroundings of a production line, for example as personal assistants at home.

In contrast to the possibilities of a planned machine usage in manufacturing processes, in this case the work field is designed for human use and ease. Thus it is not desirable to adjust the working environment to the particular technical needs of a robotic assistant.

Also, a specialization of this machine to one particular application would require its adaption for each new job it is to perform and would decline its acceptance.

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