

Integration strategies using a modular architecture for mobile robots in the rehabilitation field.

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Many new technical aids, especially in the fields of robotics and mobility, become available for the purpose of increasing the independence of disabled and elderly people. An increased independence of this group would have a positive effect on nearly every aspect of the lives of the disabled people, both on personal and vocational activities. But until now these technical aids are developed in a rather uncoordinated way, which results in many products not compatible with each other. Furthermore the level of customisation and flexibility of the overall system is very limited and quite often involves considerable additional costs.

This paper will describe a strategy to integrate these technical aids to form an integral aid which offers disabled people better opportunities to function as independently as possible. Since this integration strategy will be based upon a modular architecture, it allows users (disabled people, attendants, therapists) to compile a specific package of technical aids to a complete integral system, while still permitting them to extend or modify the system later on.

As an example of such an integrated and modular architecture, the M3S system will be addressed. Examples of the usage of wheelchair mounted manipulators, vocational workstations, navigational systems, mobile bases and wheelchairs in M3S systems will be discussed, including a description of the plug-and-play capabilities, the available development tools, the ISO standardisation process and the results of several user evaluations.

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