

Powered wheelchairs with assist as needed control

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Abstract

There is a need to develop an assistive device which can be adapted to the individual capabilities of elderly people, and which would allow them to maintain a level of fitness when pushing a wheelchair, while minimising the risk of injury to them. The control system for the assistive devices has an increasing trend of optimisation to individual capabilities to ensure less energy expenditure of users as well as to keep their health with some physical load. In addition, there is a need to reduce the overall energy consumption of the device in keeping with the current trends of reducing carbon emissions.

Here I introduce an assist controller to generate assistive force when the attendant's propelling force exceeds individual natural propelling strength based on force velocity relationship (FVR). This FVR based assist as needed control would be useful as it would allow an optimised system based on individual capabilities to be created for rehabilitation/training systems, which would allow optimum energy consumption when propelling a wheelchair.

