45. An exercise game to reduce the risk of falling

In many patients with neurological or orthopaedic disorders, but also in many healthy elderly, the ability to suddenly change the walking pattern is restricted. These people have a higher risk of falling, for example when trying to step over an obstacle. To reduce the falling risk, we have developed a fun and motivating exercise game.
During an assessment on a walking belt we measure the adaptivity of a patient's walking style. After defining a comfortable walking speed, we present a visual feedback of a target step length. The subject then needs to respond by taking smaller and larger steps respectively. The belt speed adjusts automatically to ensure a constant step frequency. We stimulate the patient to change his step frequency by controlled belt speed changes in combination with target step-lengths.
Our assessment measures how well the patient performs adjustments in step lengths and step frequencies. The better the adjustment, the lower the risk of falling.

ICT science question

How can we improve the adaptability to patterns in personal data?

Application

Specifically, how can we reduce the risk of falling by data analysis?
Our fun and motivating exercise game helps to reduce the risk of falling. Patients are challenged to change their walking pattern constantly in response to their environment. In this way they will train their adaptive capacity and reduce the risk of falling.
To prevent falls in everyday life, people need to be able to adapt their walking pattern if necessary. We can change our walking pattern for example by taking a smaller or larger step or by taking a faster or slower step. These changes in walking patterns are required in situations like passing a doorstep or avoiding a puddle of water on the floor.

Nice to know

Revalidation products based on extensive scientific research are becoming available for homecare, just in time for the move towards more practicing at home.

The system aims at accelerated rehabilitation by letting people do exercises at home as part of their daily routine.

The approach measures how well someone varies their walking pattern in response to environmental changes.

Sensors measure the degree of decreased adaptive capacity. It may predict the likeliness of a higher risk of falling.

How to measure walking patterns in response to the so-called deteriorating adaptive capacity of a person by use of sensor techniques.

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