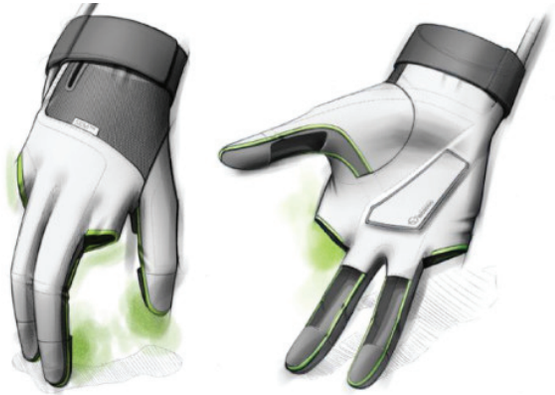
IronHand

Implementation

The glove will be iteratively tested with the involvement of older people in the Netherlands, Sweden and Switzerland. The therapeutic effects will be tested, as well as the impact of functioning of older people when performing everyday activities at work and at home. Performing these tests will not only give a demonstration of the results, but also ensures that the product will fit the needs of the end-user perfectly.



IronHand

At a glance

Consortium	6 partners from 3 countries
Start	1st of May, 2014
Duration	3 years
Programme	Ambient Assisted Living Call 2014
Budget	€ 4,470,381.00
Contact	Coordinated by Roessingh Research and Development Project coordinator Gerdienke Prange, RRD g.prange@rrd.nl
Website	www.ironhand.eu

Partners

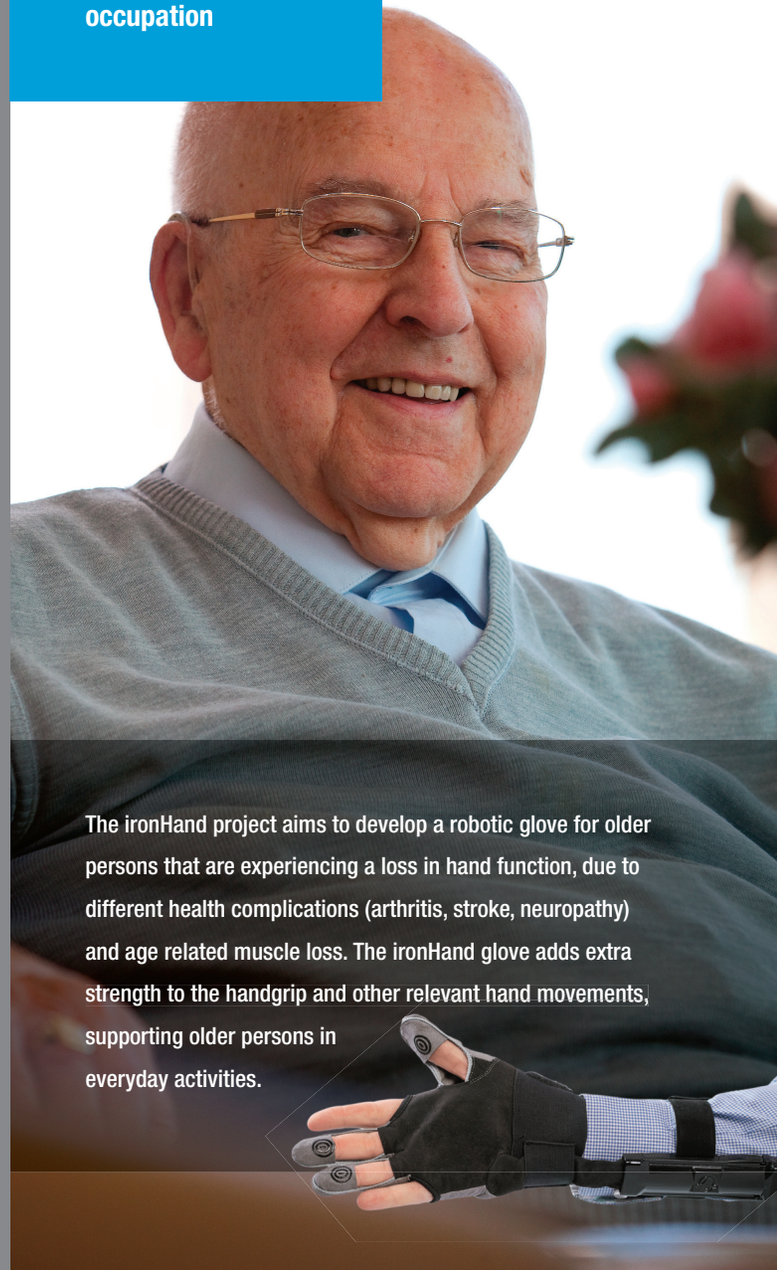
Roessingh Research and Development · BIOSERVO · Hocoma · nationaal ouderen fonds · Eskilstuna kommun · terz Stiftung

Funding Authorities

AAL Ambient Assisted Living · ZonMw · VINNOVA · Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra

Smart glove with intention detection and mechatronic finger actuation supporting elderly occupation

ironHand



The ironHand project aims to develop a robotic glove for older persons that are experiencing a loss in hand function, due to different health complications (arthritis, stroke, neuropathy) and age related muscle loss. The ironHand glove adds extra strength to the handgrip and other relevant hand movements, supporting older persons in everyday activities.

IronHand

Objectives

ironHand has three main objectives:

1 Providing an assisting impact, support of daily life. By giving more grip and hand strength, older adults will be enabled to continue managing their occupation in any working environment.

2 Preventing health problems, maintaining or improving grip strength for preserving health, motivating to stay active and increase their participation in life, with the help of a training function.

3 Marked improvement in older adult quality of life, as evaluated by 360 degree surveys (user, family and doctors).

IronHand

Innovations

Innovation 1
Smart intention detection

The glove will have an intention detection logic that activates the support only if the user initiates the movement by a natural and intuitive movement. The force provided by the glove will only complement the existing function of the user, not replace it.

Innovation 2
Ergonomics and design

The ironHand system will be small, so it is portable and usable for support during occupation outside of people's homes and for longer periods of time. The materials will be lightweight and easy-to clean material to ensure that the glove is usable for multiple tasks and functions.

Innovation 3
Modular, personalised and adaptive approach

Separate modules for hand grip and opening for example, allow for a personalized device supporting only those activities that are needed based on the specific abilities and limitations of a person. The amount of support adapts to the changes that come with aging, to make it possible for the older adult to contribute actively, not only physically but also in actively managing their own health status.

Innovation 4
Hybrid functionality for assistance and training

As ironHand is modular, adaptive and personalized, it is a small step to turn it into a training device as well. Adaptive training software will take user's daily activities and environmental situation into account. At the same time, integrated databases allow users to manage their individual exercise plan. By using this function, users will be able to maintain or improve their health status.

Innovation 5
Interactive two-way communication (telehealth)

The ironHand system will allow sending data from the glove to a clinical supervisor (such as a doctor or therapist). The software will also make it possible to have interactive two-way communication between the older person and the supervisor (to provide motivation and feedback when needed) and provides an easy personalization of the treatment regime.