

SMILING PROJECT

Mobility means freedom, flexibility and autonomy to all people, especially for older ones. Developed countries are characterized by high mobility that plays a very important role in promoting healthy aging, because to be mobile can delay disability and prevent frailty.

Aging is characterized by functional changes in the sensory, neurological and musculoskeletal systems, affecting motor tasks including gait and postural balance. Gait and balance disturbances in older people are the main risk factor of falling.

One third of people aged over 65 risks falling or had a falling experience. These falls cause physical injury, emotional trauma and mobility avoidance. Beside severe social consequences, there are significant financial impacts on health care system.

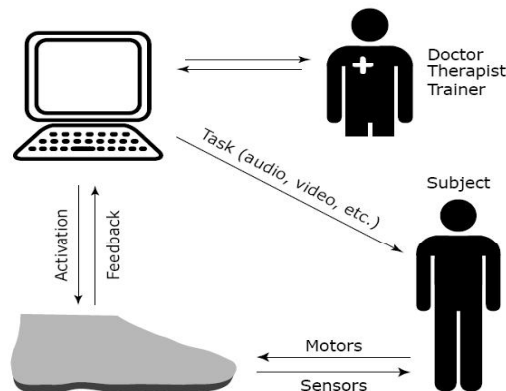
The European project SMILING plans to diminish age related impairments through the interference of decreased neural plasticity that limits walking ability and by continuing these functional improvements into real life situations.

The scientific basis of the design is based on chaos theory and the theory of dynamic systems, applied to the training of rehabilitation in the older population. The approach is intended to challenge older people to solve new motor problems in real time by inducing changeable environments that need active response and problem solving.

On the basis of this theory, SMILING will develop an advanced next-to-market prototype of a system to improve walking and the mobility of aging population reducing risk of falling.

The device will include three sub-components:

- a wearable sub-system, embedded in the shoe (SMILING shoe) that will perform chaotic changes of shoe sole and heel heights or inclination in different directions to challenge the user with new ground configurations;
- a miniaturized sensor that will measure biomechanical parameters enabling gait monitoring and accurate evaluation of the walking recovery process;
- a control and processing unit for personalization, tuning and control of training programs, that will gather data coming from the sensor for data processing and will include also an user interface to allow interactive and pro-active motor training.



OBJECTIVES OF SMILING

SMILING aims to develop innovative training programs for elderly people with the objective of improving walking and balance, and to prevent and counteract falling.

The overall objectives are:

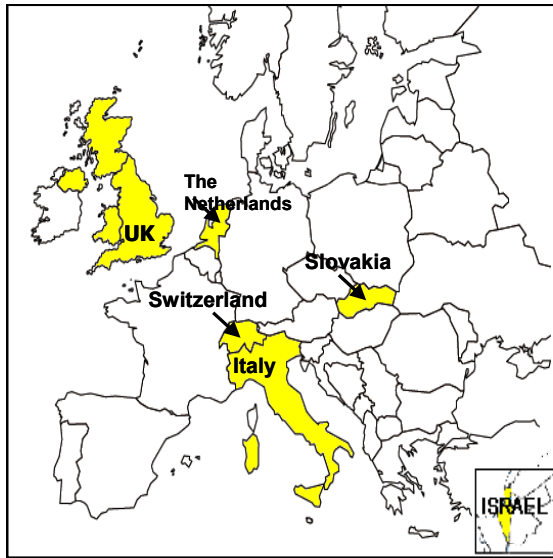
- to develop and construct an advanced prototype of a wearable not-invasive computerized miniature system for mechanical chaotic perturbations of gait pattern in order to counteract and prevent tendencies to fall;
- to develop perturbation algorithms fitted to suit individual user's specific needs;
- to implement a training system to be spread in rehabilitation, health care and fitness centres for a reorganization of the rehabilitation process in ageing.

The target of SMILING is represented by older people who are at risk of falling or had a falling experience and need a rehabilitation programme. SMILING system will be designed to allow flexible use in clinical, rehabilitation, fitness environment and at home.

Acceptance by the users, reliability and ease of use are mandatory specifications of the project.

The device will be tested by older people in Italy, Israel, Slovakia, and Switzerland.

The validation of the system will be strictly monitored by clinical and rehabilitation professionals and will be performed according to the national ethical rules.



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SMILING

Self Mobility Improvement in the eLderly by counteractING falls

FP7 ICT & Ageing- GA No. 215493

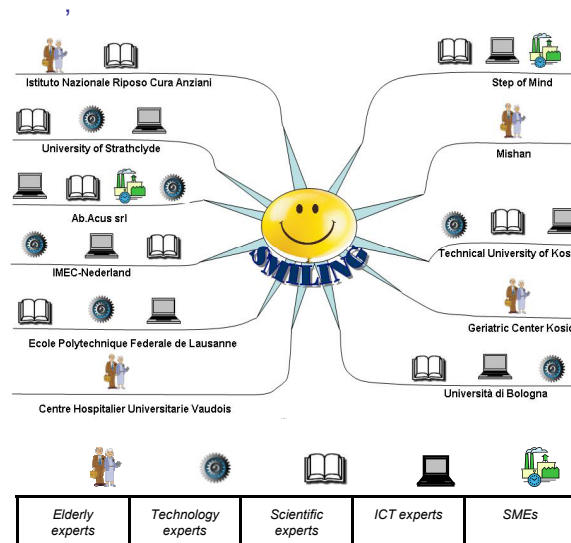
www.smilingproject.eu

SMILING CONSORTIUM

This multi-disciplinary Consortium, involves experienced scientists in fields of electronics, mechanical engineering, computer programming, rehabilitation, and geriatrics. Eleven Institutions and companies from 5 European countries (Italy, Switzerland, United Kingdom, The Netherlands, Slovakia) and Israel participate to the project.

Participants

Institution	Country
INRCA - Istituto Nazionale Riposo Cura Anziani V.E.II (Coordinator)	Italy
University of Strathclyde	United Kingdom
Technical University of Kosice	Slovakia
Step of Mind	Israel
Alma Mater Studiorum Università di Bologna	Italy
Stichting Imec-NL	The Netherlands
Ab.Acus	Italy
Ecole Polytechnique Federale de Lausanne	Switzerland
Centre Hospitalier Universitarie Vaudois	Switzerland
Mishan	Israel
Geriatric Center Kosice	Slovakia



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