

The European Project SMILING: Self Mobility Improvement in the Elderly by Counteracting Falls



*F. Marcellini, **M. Bulgheroni, ***S. Bar-Haim

(*INRCA-Scientific Technological Area, Ancona, Italy **Ab.Acus srl, Milano, Italy ***Step of Mind Ltd, Tel-Aviv, Israel)

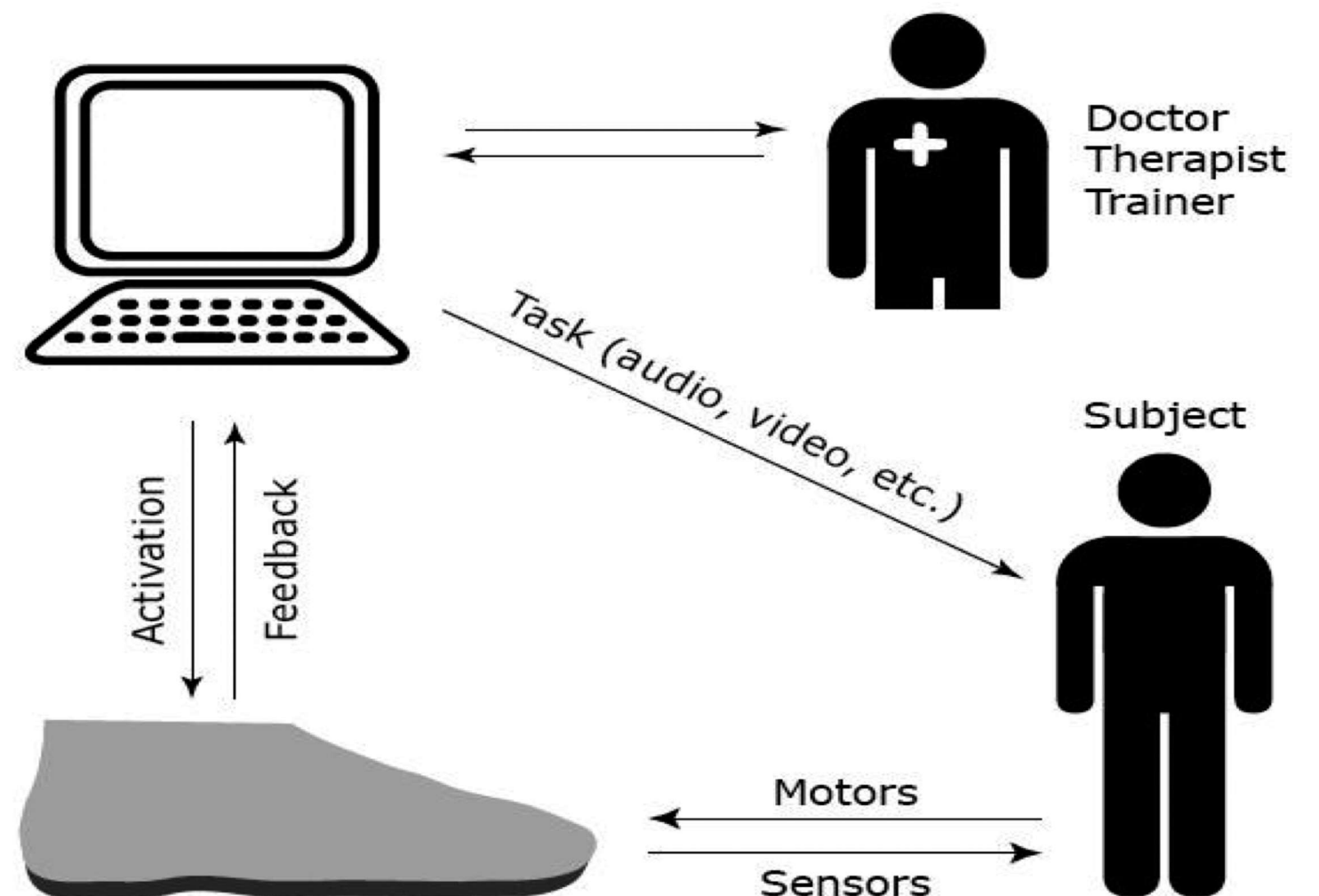
Introduction. The European project SMILING (FP7, ICT, GA 215493, EC funded € 2.250.000) has begun its activity on 1st January 2008. Eleven research centers, universities and companies from 6 countries (IT, CH, UK, NL, SK, IL) are involved in it. A multidisciplinary Consortium was created: 25 scientists, specialized in different fields (such as mechanics, electronics, psychosocial disciplines, medicine, physiotherapy, etc...) are working at the project.

Objectives of SMILING. The main objective of the project is to diminish age related impairments by interfering with functional disability and to improve mobility and social inclusion of elderly people, inducing variable environments that need active response and problem solving from the target population.

SMILING aims to develop innovative training programs for elderly people with the objective of counteract falling, improving walking and balance. 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 centers 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 is going to be designed to allow flexible use in clinical, rehabilitation and fitness environment. Acceptance by the users, reliability and ease of use are mandatory specifications of the project.

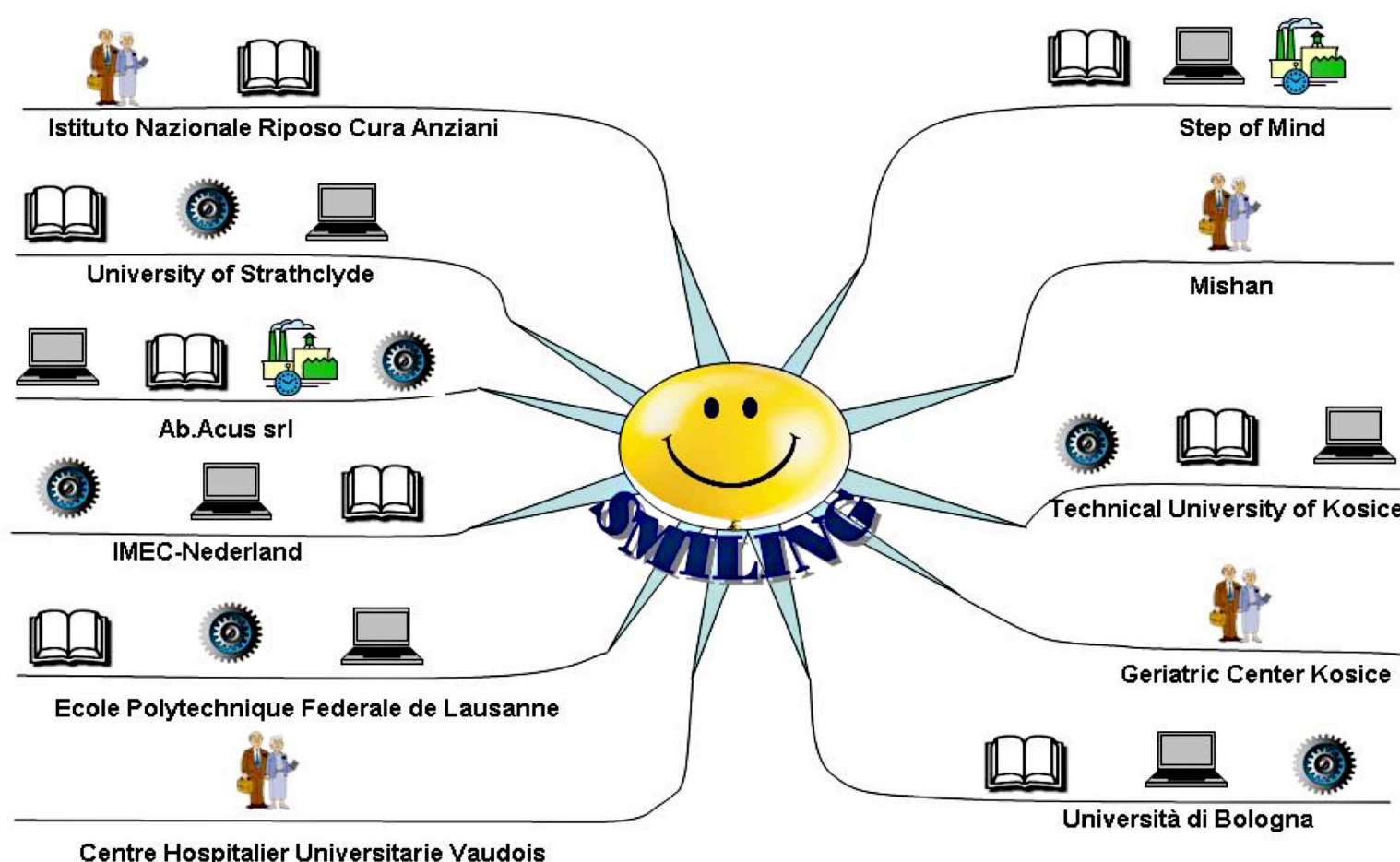


Methods & Materials. The prototypes of the system will be built and tested on the end-users in four validation sites (IT, IL, CH, SK), using a protocol of training and questionnaires to evaluate psychosocial aspects, acceptance and safety of the new technology. For the validation phase, a randomized controlled cross-over trial will be assessed on 96 subjects. The validation of the system will be strictly monitored by clinical and rehabilitation professionals and will be performed according to the national ethical rules.

Results. A preliminary *user perspective survey* were taken by a sample of 68 elderly people and 35 professionals, recruited in the four validation countries, in May 2008. The survey has shown that the maintenance of independence is the most important expected SMILING outcome (97%) for older people, considering that interviewed experience fear of falling sometimes (50%) or always (25%). For the professionals, SMILING fall-related program could be very useful (mean±SD; 7.2±2.1). In general, the survey reinforced the idea that acceptance of the Smiling device by elderly will depend on providing good information and assuring the highest level of safety in the exercise program as well as the device. Moreover, it is crucial to emphasize Smiling program benefits for health in general and mobility as well as fall prevention in particular. Health professionals shared similar opinion about safety and the need of providing clear information about the device and the program.

Conclusion. Elderly at risk of falling can be considered to be suffering from an involuntary motor behaviour, that restricts their participation in society. The elderly technology acceptance represents an open issue to detect for the future development of gerontechnology solutions.

Acknowledgment. The research leading to these results has received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 215493.



 Elderly experts	 Technology experts	 Scientific experts	 ICT experts	 SMEs
---	--	--	---	--