

PRoF Award abstract – Call 2015

<Cycling through your past>

1. Research Outline

Acronym	Cycling through your past
Project name in English	Cycling through your past
Pitch (1 sentence)	Cycling through your past develops an intuitive platform for nursing home inhabitants to break down the four walls of the nursing home, and rediscover the outside world while cycling on a hometrainer.
Executive summary (max. 10 lines)	<p><i>“Cycling through your past” is an award-winning project that develops an innovative user-centered solution for nursing home inhabitants to remain physically active in a safe, enjoyable, and motivating environment. The user is able to explore the world outside of the four walls of the nursing home through hyperlapse video projection of 360° images (Google Streetview like) while cycling on a hometrainer. Because the platform can be fully designed around the physical and mental possibilities of each individual user, the nostalgic character of the platform has substantial added value for individuals with declining abilities. First experiences have shown that the platform offers access to secure, personalized, and meaningful physical activity for the elderly users and at the same time increases the social cohesion within the nursing home.</i></p>

2. Cause and context of the research

The project “Cycling through your past” is built around the hypothesis that regular physical activity contributes to the physical and mental health of individuals. For different target populations, programs are set up to motivate individuals to engage in low threshold physical activity. As examples, one can think about the success of the different ‘start-to-run’ programs or the ‘sportelen’ approach the Flemish government and Bloso use to motivate individuals over 50 years old to remain physically active.

For the old-elderly population (typically above 80 years of age) however, remaining physically active is a challenge, among others because of their often rapidly declining physical and cognitive capacities, the presence of co-morbidities (different chronic diseases at once), and onset of frailty. Because of the growing importance of this subpopulation however due to the demographic evolution (the Silver Wave or “vergrijzing”), keeping these individuals engaged in low-threshold, meaningful physical activity can have an important advantage in terms of quality of life, lowered health care costs, and improved overall self-reliance and self-image.

Within the “Cycling through your past” project, an interactive platform is developed in which the inhabitants of nursing homes can bike around in the area they used to live in. In this platform, a hometrainer is connected to a projection system that captures the whole vision field of the user. The system then stitches together 360°-pictures (like those known in Google Streetview) in a so-called hyperlapse-video. These videos are shown projected onto the screen, and the user needs to continue cycling on the hometrainer to progress through the streets, exploring his/her past living area and reliving some of the memories they have of the time when they were still living outside of the four walls of the nursing home. Because the system can be fully designed around, and controlled by, each individual user, the nostalgic character of the platform has substantial added value for individuals with declining physical and cognitive capacities, while at the same time offering access to secure, personalized, and meaningful physical activity.

The conceptual architecture of the project was designed by Jan Smolders, Director of nursing home Witte Meren in Mol, following a training session for young nursing home executives, in which the task was to come up with a solution for an existing problem experienced in the everyday operations of nursing homes. The technological platform was built around this concept, illustrating the solution-driven and market-pull character of this project. The project has already received an Innovate2Care Award (HealthCare Fair, October 2012) and the Care-To-Innovate award of the Kempische InnovatieRaad (Feest van de Innovatie, September 2014). Following these awards, extensive media coverage was obtained in all Flemish newspapers and radio stations, and also including a 2-minute report

on the Eén news¹. Both awards clearly illustrate the two keywords that describe the cycling through your past project best: “Innovate” and “Care”.

3. Innovation results achieved

From the pilot tests that we have been conducting in the development of our platform, we have already found that the project has an immediate impact for the different stakeholders involved in caring for nursing home inhabitants:

- The nursing home personnel (nurses, physiotherapist,...) can use a platform that enables users to engage in motivational and meaningful physical activity with minimal supervision within the security of the nursing home;
- The elderly end-user has the opportunity to explore his/her past living environment, reliving memories;
- Although we still need to further build the evidence-basis around the Activ84Health.eu platform, scientific literature clearly shows that regular engagement in physical activity, particularly the forms that motivate and stimulate users for self-exploration, stimulate physical and cognitive capacities.

Activation of nursing home inhabitants is essential to maintain a high level of physical and mental fitness as long as possible, but can be very demotivating if only staring at a wall or through a window when doing biking exercises. The “Cycling through your past” platform provides a safe, secure, and personally adaptable platform in which these activities can be performed. The unique advantage of the “Cycling through your Past” platform is that it allows for complete freedom of movement and route choices of the user. At each crossroads or intersection, the user can decide to go left, right, or in each direction he or she desires to go (as long as Google Streetview images are available). This also implies that while initial tests show that our end-users primarily want to bike around their past living environment, they could just as easily bike through New York, Sidney, or even visit the Mount Everest Base Camp... The opportunities of the “Cycling through your past” platform are virtually endless, and are only limited by the end-user’s imagination (and the availability of Google Streetview images).

An additional major advantage that we did not anticipate yet became very clear in our initial tests, is that as most of the inhabitants of the nursing home used to live in the same neighbourhood, town or city, they engage in story-telling about the images and roads that are shown in the hyperlapse projections. While only one user is sitting on the hometrainer, exploring the town, 15-20 others sit around the screen telling stories about the past, and can relive how they experienced the neighbourhood from their memories. As such, the “Cycling through your past” platform also strengthens the social cohesion of the nursing home community.

¹ Link to the news report: <http://deredactie.be/cm/vrtnieuws/videozone/programmas/journaal/2.36285?video=1.2131978>

4. Link to the PRoF values

The project directly addresses several of the PRoF values:

- **Minimal comfort:** while initially the “Cycling through your past” initiative was specifically aimed to be implemented on a hometrainer (pilot setup), we have explicitly chosen to break away from this user platform as it only provided a solution for users with sufficient proficiency to use a hometrainer. With the current tablet-based solution (being prepared for market introduction), we are able to have a ubiquitous solution that elderly users can use on a hometrainer, a treadmill, with a tracker ball, or even without any means of propulsion (on auto-mode). This decision drastically increases the useability and comfort of users with different physical capabilities;
- **Privacy:** For each individual user, a dedicated user profile is made which can be adapted to fit the physical, mental, and cognitive capacities of the user. As such, privacy of all users is safeguarded, and the dignity of each individual user remains guaranteed;
- **Security:** Inhabitants of nursing homes are usually confined to stay within the four walls of the nursing homes. However, many of their memories of the past are related to outside-of-the-wall locations. The “Cycling through your past” platform offers the opportunities to revisit these locations (their old homes, the houses of their children,...) from within the safety and security of the protective environment of the nursing home;
- **Anti-loneliness:** the most surprising result we observed when initially testing the “Cycling through your past” platform was that while there was one individual using the solution, 15 to 20 other nursing home inhabitants joined the active individual and started talking about the images shown on the big screen. As such, a culture of storytelling was developed, where individuals were able to relate personal experiences about their past life on the locations visited by the cycling individual. This interaction among cyclist and onlookers greatly enhances the social coherence in the nursing home. Secondary future developments (outside of the scope of the current developments) also include the opportunity to create a virtual social network of fellow-cyclists, who can share memories about locations, suggest routes, and meet along old friends along the way. As the system knows the location of each user at all times (images are geo-located), it can also predict when two separate users are within each other’s neighbourhood, and can propose starting a conversation through the built-in video opportunities of the navigation tablet;
- **Non-stigmatising solutions:** as mentioned earlier, the decision to break away from the hometrainer as sole hardware platform also provides individuals with lower physical and mental fitness to use the system from a sofa, bed, or any other means one wishes. As each individual has a personalised user profile, future applications such as games, physical activity routines,... can be fit to each individual’s potential;

- **Inter generational:** The basic premise of the Cycling through your past platform is to allow users to go and explore their past city where they used to live before they went to the security of the nursing home. As users are cycling through their city, an aspect of gamification can allow children or grandchildren to add e.g. puzzle pieces in the map, which the grandparent needs to collect. Based on a user-defined physical activity scale, grandparents will be able to “fight a battle” with their grandchildren about who is fittest, or does the most physical activity in one week;
- **Respect:** Co-creation and user-centered design are two keywords in the “Cycling through your past” project. The original idea of the project started as a task to come up with a solution for a defined problem in a nursing home. Therefore, the system is set up keeping in mind respect for the (possible) reduced physical and/or cognitive functions of each individual user, and can be set up in such a way that it provides a meaningful and motivational environment for each user;
- **Flexibility:** As the system can be personalised for each individual user, it can very easily be tailored to meet every user’s capacities, ambitions, and desires. The key innovative aspect of the Cycling through your past platform is that it allows full user freedom, where different user-defined routes can be made at each intersection. The system therefore is fully flexible, both between different users, and also for each individual user.

5. Applicable IPR rules

Currently, the partners involved in the “Cycling through your Past” project (see below) are working towards a joint start-up company to develop a minimum viable product and start commercialisation of the “Cycling through your Past” platform. All IPR therefore is put under the statutes of the start-up company in joint agreement of all parties involved.

6. Information on the partners

The “Cycling through your past” project emerged from a cooperation between Woonzorgcentrum Witte Meren (Mol), the Flemish Institute of Technological Research (Vito, Mol) and the Computer Sciences Department of the Catholic University Louvain (Leuven).

Aspects of the project, including the engineering of a first pilot home trainer solution, were conducted by students from Group T (Leuven), and also currently side-projects, related to the Cycling through you Past project are being conducted by students. Also, these projects were submitted to CERA-Award, as we envision the opportunities for students to develop specific aspects of the project as very valuable. More than a simple business development project, our project is embedded in the principles of social entrepreneurship, community service engineering, and co-creation of both economic and societal value.



Addendum: Contact information

“Cycling through your Past” team

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