

# Results from the iNeighbour TV Field Trial

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## INTRODUCTION

The iNeighbour TV system is a social interactive television application designed and implemented with the aim of helping elderly people in their daily life. Its intended contribution to the improvement of senior citizens' quality of life goes beyond the field of social relationships and a virtual extension of the neighbourhood concept. Taking advantage of its communication and monitoring systems, it also assumes a health care role by providing useful tools for both patient and caregiver [1]. After its implementation, the system was evaluated in a field trial during which a set of real users were able to try the full application giving the team a chance to evaluate the potential impact of the project in the quality of life of senior citizens.

## SYSTEM FEATURES

Based in an in-depth analysis of the target audience and taking in consideration the project's objectives, a set of features was conceptualized and implemented in six modules: i) community; ii) health; iii) leisure; iv) information; v) placard and; vi) communication.



Figure 1. iNeighbour TV model and main menu.

Each of the first five modules has its own set of subareas while a communication module aggregates a set of features that are used in different situations to enhance other existent features.

The **Community area** aims to assist the establishment of new relations and strengthen existing ones through social interactions mediated by television. This module is divided in 3 subareas: i) Friends; ii) Profile; iii) Search.

In the *Friends subarea* the user can see who of his friends is online; know what they are watching (with the option to jump to the same TV channel); and start an audio call – eventually about what is happening on TV. In the *Profile subarea*, the user settings can be edited including the definition of interests and skills – a special relevant information when other people want to search for unknown iNeighbour TV users that correspond to a common interest or a required skill, e.g. search for other users that also like movies or that have a special talent in gardening (they do this in the *Search subarea*). The system can also use the location of the STBs running the iNeighbour TV application to sort the results by proximity easing the process of finding “Neighbours”.

The **Health area** is one of iNeighbour TV's most important modules. This module supports the following complementary subareas: i) Medication Control; ii) Appointments and; iii) Management of medical prescriptions.

The *Medication Control subarea* is a key feature of the iNeighbour TV. Health problems usually are felt more intensively in this stage of life, often leading to a medication dependence on an everyday basis that can be difficult to deal with when memory loss issues are at stake. This feature is centered on a medication agenda; on an automatic trigger of reminders (displayed over the TV image) and; on the delivery of complementary e-mails or SMS in all occasions that the user does not acknowledge the reminders sent to his TV set. The *Appointments subarea* allows the user to check a health schedule and get notifications or alerts about upcoming appointments.

Complementary to the features in the Health area other attributes, transversal to the whole application, also address health situations. Senior citizens often require permanent assistance or surveillance from caregivers (either relatives or health professionals). To provide alert and monitoring features, accessible to a caregiver that is indicated and authorized by the elder user, the system is able to keep track of the user's television viewing habits and detect when a significant variation occurs. This deviation combined with occurrences of falling to take medications might trigger a warning alerting the caregiver via a web mobile APP.

The **Leisure area** includes features to encourage seniors to leave the front of the TV to socialize and to do physical exercise. In this module the user has access to three subareas i) Events; ii) Calendar; iii) Community.

The *Events subarea* enables the user, with the aid of a wizard, to create a "rendez vous" and invite participants, to a specific location at a particular date and time; the *Calendar subarea* allows a quick overview of what the user has to and might do and; and the *Community (service) subarea* enables the user to search and apply for community service or voluntary work offers that match his skills and work history.

The **Information area** provides useful information to the daily routine, like weather reports or pharmacies on duty nearby the user's location. This feature is interrelated with the 'leisure area' being able to, as an example, suggest the creation of a new outdoor event if the weather forecast is favorable.

The **Wall area** is similar to a social network wall that streams status or events updates from the user's contacts.

Finally, the **Communication module** provides support to several features of other modules. It supports TV based text communication and, considering the elders potential problems with vision accuracy, SMS reading and creation. This allows users of the iNeighbour TV to read and reply to text messages redirected from their mobile phone. Nevertheless, audio calls are also supported in the system.

## FIELD TRIAL

The system was evaluated in a field trial with the participation of a set of users living in two cities in Portugal (Aveiro and Porto). The main goals of this evaluation were related with sociability, acceptance and usability issues including: Understand the potentialities of the system to increase social interaction and wellness; Screen the most suited and appreciated areas; Understand how the users incorporate the usage of the system into their daily routines; Evaluate the usability and user experience provided by the system.

For an easier explanation of the associated methodology the evaluation process was structured in three phases: i) characterization of the sample; ii) promotion of the evaluation in the houses of evaluators and data gathering and; iii) data analysis.

**Phase 1** – Find a set of users willing to participate in a field trial is not an easy task [2], especially when elder are at stake. First, a smooth and gradual approach to members of a senior university in Aveiro and members of an already established community by familiar bonds in Porto was carried. This set of potential evaluators answered two articulated questionnaires aiming their characterization in terms of: sociodemographic characteristics; TV consumption habits; social and physical activity; health care needs; technological literacy; and, finally, willingness to participate. We ended up with a total of 10 participants; in the age range of 61 to 75 years old; balanced in terms of gender; with different levels of education (50% only completed the elementary school whereas the remain went until a full graduation); and diverse types of occupations (70% retired, 10% idle and 20% still working).

In order to understand how cognitive, physical and social aspects of each participant could interfere with their experiences with the system, a scale of evaluation of each one of the mentioned dimensions was constructed. For this task, we base our analysis in the conjunction of already existing scales, namely the UCLA Loneliness Scale; the Whoqol Scale; the International Classification of Functioning Disability and Health, both from the World Health Organization and; the Mini Mental State Examination. We tried to pursue this evaluation in a discreet and careful manner, delivering the necessary questions and observations during the personal meetings, phone calls and questionnaires. With this procedure, it was possible to characterize the participants in terms of levels of sociability; spatial, identity and temporal orientation; visual and hearing acuity; touch capacity; memory; concentration; speech ability; and multitasking performance. Most of the participants show total memory (70%), with a complete sense of orientation (100%). Concerning the touch capacity, we have noticed that half of the users present no difficulties, although a considerable percentage had a light (20%) or a heavy (30%) constraint in the use of the remote control. In matter of attention, speech ability, visual and hearing acuity, all the participants showed no difficulties (100% for all). As for the multitasking performance, we noticed that, although the majority

showed no trouble (60%), a significant percentage displayed some difficulties in doing more than one action simultaneously (40%). Regarding to the sociability dimension, we can consider this sample to have a high degree of social activity: most of the respondents assumed to go (e.g.) to the cafe at least once a week (60%) and; visiting, or receiving visits of family or friends, were activities held with the periodicity of one or two times a week (60% and 80%, respectively).

**Phase 2** – To get the evaluation running some decisions were supported by the examples analyzed during the literature review [2] [2] [2]. From this, it was decided to make a step-by-step deployment of the several areas in the evaluators' homes (1<sup>st</sup> stage - health and information areas; 2nd stage - addition of the community, leisure and placard areas; and finally at the 3rd stage - communication features were introduced). Each one of these stages (taking a total duration of 5 weeks) was preceded by a face-to-face demonstration of the features being evaluated. During the explanation sessions, the participants were given a brochure with the active features of each stage and a card with the data required to use the system. Along with this procedure, a strategy for providing remote monitoring of the usage of the system was deployed.

To gather all the necessary data, the following collection instruments were used: i) small questionnaires performed at the end of each stage of deployment; ii) system statistics monitoring; iii) personal and phone calls to gather informal feedback; iv) participant observation during the face-to-face demonstrations - in order to understand the learning curve of the system over time. At the end of the field trial, a final questionnaire was delivered and some of the evaluators where interviewed.

**Phase 3** – After gathering all the data it was possible to analyze it leading to the following results (here presented by each one of the available areas):

**Community:** This area reached a high degree of interest, with 50% of the evaluators mentioning that searching for friends by name, interest or skills was one of their favorite functionalities. This search is potentially connected with the desire of sending friend request and adding friends to the list, being that 70% of the users mentioned these possibilities as highly interesting. In terms of ease of usage, most respondents pointed that sending friend requests was a task very easy to do (60%).

**Health:** One of the main concerns of the senior population is the organization and management of their health care. A major aim of the system is, therefore, to aid individuals in this process, increasing their autonomy at least in the control of their medication. As the results reveal, the majority of the respondents consider the possibility of checking their medication agenda as very interesting (70%), as was also the case of receiving medication notifications on their television screen (80%). Most users also mentioned that was easy (30%) or very easy (60%) to visualize the health related information.

**Leisure:** As noticed in the Community area, the evaluators seemed to be quite enthusiastic about features that imply or encourage social interaction. Therefore having the possibility to create events; and to send and receive invitations was highly appreciated, with 80% and 70%, respectively pointing these actions as very interesting. They also declared that this task was very easy to conclude (60%).

**Information:** Concerning this area, the gathered results show that knowing information about the weather was considered very interesting by 90% of our users, and, associated with it, receiving warnings of the civil protection was also measured in the same level of interest, 70%.

**Communication:** As for the option of communicating through television, either between television sets, or to a telephone, 70% of the evaluators indicated that it was a very interesting functionality. Each one of these tasks, either communicating by voice call or message, was pointed to be very easy to do (80% and 70% respectively).

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