

BoConnect – Reliable Assistive Technologies to Empower Elderly People to Live Independently Longer

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Abstract. BoConnect was a multi-disciplinary collaborative research project between Linnaeus University and Våxjö and Kalmar municipalities in Sweden. The project had a budget of 3 MSEK; it started Jan. 2015 and ended Dec. 2016. The project studied reliable assistive technologies to support elderly people. In contrast to existing work in this area that is often limited to small-scale technology-driven pilots that are poorly embedded in the social living context, the BoConnect project took a holistic perspective on assistive technologies and put user needs and reliability of the solutions in focus, both from a technological and organizational perspective. This report summarizes the main results of the project.

1. Introduction

The BoConnect project studied reliable assistive technologies to support elderly people. The target group was elderly people living in their own houses that are at the point where they become increasingly uncertain about whether they are able to cope with challenges of their daily life.

Previous work in this area is often limited to small-scale technology-driven pilots that are poorly embedded in the social living context. In the BoConnect project we took a holistic perspective by putting user needs and reliability of the assistive technologies in focus. Through extensive multi-disciplinary research in close collaboration with actors in the field, the project delivered significant research results that pave the way to large-scale adoption of assistive technologies for elderly people.

To identify needs of elderly people and other stakeholders that could be addressed by assistive technologies, we conducted a needs analysis based on a systematic literature review and interviews with elderly [6,7]. The results show that participative design with attention for individual needs is a key factor for successful design of technology. Factors for successful use of technology are cross-institutional collaboration and interoperability. Finally, proper education to utilize technology is a key factor.

2. Results

Ensuring reliability is a prerequisite for large-scale adoption of assistance services. We focussed on reliability from the viewpoint of guaranteeing high-quality services. We used a tele-assistance service (TAS) as a use case. TAS periodically measures vital parameters of an elderly person via sensors embedded in wearable device (e.g. heart beats). The data is sent to an analysis service that may inform a social worker to visit the elderly or alarm an emergency

service in case of urgency. A reliable TAS should be robust, respond quickly, and the cost for using the service should be reasonable. We developed two novel approaches based on different mathematical techniques and demonstrated that they guarantee reliability of TAS regardless of uncertainties such as reduced quality of the network.

We summarize two additional services we studied in the project. The first is a heart monitoring service that consists of a device that measures the weight of the elderly and based on a personal profile identifies potential heart problems of the elderly. The device provides information to the elderly to take the appropriate action (e.g. make an appointment with a doctor or go to the hospital as soon as possible). Second, we studied a remote rehabilitation service [1-5, 8, 9] that allows physiotherapists to interact with elderly remotely. The physiotherapist can give instructions to the elderly to perform exercises and follow the elderly on a video. The elderly can see him/herself on a larger screen. This screen can be frozen; the elderly can then draw on the screen, for example to indicate areas on the body. We evaluated both services during several workshops with stakeholders in the field.

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