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# Living with the User: Design Drama for Dementia Care through Responsive Scripted Experiences in the Home

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## Abstract

Participation in forms of drama and narrative can provoke empathy and creativity in user-centred design processes. In this paper, we expand upon existing methods to explore the potential for responsive scripted experiences that are delivered through the combination of sensors and output devices placed in a home. The approach is being developed in the context of Dementia care, where the capacity for rich user participation in design activities is limited. In this case, a system can act as a proxy for a person with Dementia, allowing designers to gain experiences and insight as to what it is like to provide care for, and live with, this person. We describe the rationale behind the approach, a prototype system architecture, and our current work to explore the creation of scripted experiences for design, played out through UbiComp technologies.

## Author Keywords

Dementia; Design; Drama; Scriptwriting; Acting; Home

## ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

## **Introduction**

The goal of the 'Stories of User Appropriation' (SoUP) project is to develop new approaches that link user-centred design (UCD) and the performing arts. Our specific domain of interest is assistive technologies for Dementia care. SoUP aims to produce innovative methods to engage designers in user-centred processes via innovative and accessible design drama methods. By working with filmmakers, scriptwriters and actors, and with input from medical and carer expertise in academia and industry, we are exploring several means of expanding UCD in this complex domain.

This paper reports work in progress to develop an ambitious approach emerging from the project. In this we aim to support designers to have experiences that reflect what it is like to live with a person with Dementia, and take on the role of carer, in their own home. Scripts and recorded segments of acting are produced that reflect data captured through a cultural probe study with carers. Elements of these are then triggered by events in the home, via a range of sensors and output devices such as tablet computers. Through working with a combination of UbiComp technologies, acting and scriptwriting, we hope to provoke empathetic and creative responses in technology design for the everyday issues faced in Dementia care.

## **Related Work**

While many UCD approaches aim for the point of view of a detached observer, Kuutti et al. argue that participation in the enactment of scenarios can lead to creative responses by requiring interpretation and improvisation [3]. Through performance activities, designers can immerse themselves in a situation in a visceral, embodied way. Buchenau and Suri make a

similar argument in describing 'Experience Prototyping'. They find direct experience valuable in understanding existing user experiences, exploring designs, and communicating ideas to clients or colleagues [2].

While underexplored, the potential of the performing arts to augment exploration and communication of UCD for health and wellbeing has been identified. For example, Morgan et al. devised an interactive theatre piece as a means to gather requirements for telecare equipment. They find that detailed professional writing, acting and direction contribute to engagement, and to challenging prevalent beliefs and perspectives [5]. As physical environments and social interactions are essential aspects of ubiquitous computing, it is important to introduce realistic forms of these contextual elements into UCD methods. Odom et al. describe 'User Enactments', in which participants are asked to enact loosely-scripted scenarios with props in their homes or a mocked up home environment [6]. In this paper, we describe a further approach that uses UbiComp technologies as a means to introduce fictional characters and narratives into a real home.

## **Challenges for UCD in Dementia Care**

We are developing this approach with the following issues that impact upon UCD for Dementia care in mind:

***Comprehending Dementia care is difficult*** without building rich, participative understanding. Dementias and technologies designed for support are lived with over long periods, and are not easily represented for evaluation through existing methods. Variations between Dementias, individuals, and disease progression, add complexity. Communication between stakeholders is key to avoiding mistaken beliefs continuing through the design process.

Margaret is in her late 80s and lives in her home. Her son Terry visits her a couple of days a week.

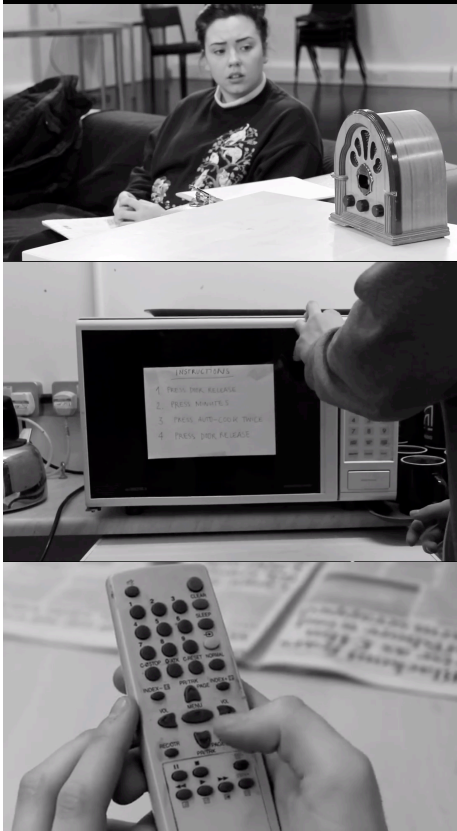


Figure 1: Short films created from the cultural probe data: A starting point for responsive scripted experiences.

**Access to users is limited** and the participation of Dementia patients in UCD research raises ethical and practical difficulties. Standard UCD approaches may be inappropriate. While participation from carers is possible, they are often extremely busy people.

**Data from UCD research may not be used effectively in healthcare design processes.** While the importance of UCD is recognised, more needs to be done to effectively communicate findings and integrate these [4].

### **The Concept: Responsive Scripted Experiences in the Home**

The concept for this approach is to use UbiComp technologies including sensors and tablet computers, to allow characters and stories to be presented in a responsive and context aware form in a home. Through a cultural probe study with 5 carers [1], we have captured rich qualitative data on experiences of caring and everyday situations that arise. This provides grounded inspiration for creating scripts that represent situations and behaviours found when living with Dementia. We have also created short films with this data (Figure 1). Expanding from the content and form of these, the approach will provide a means for playing roles and responding to characters actions to actively involve a participant in design processes.

In a simple example based on the probe data and films, a designer participating in a responsive scripted experience would enter their own living room, and a tablet computer, representing the character with Dementia, would talk to them via recorded audio segments of acting, or speech synthesis. They would explain that they are struggling to use the television. The television in the room would turn on and off as they discuss this (via wireless mains

switches). The participant responds by interacting with a tablet screen, and with the television and remote itself. The character later says that they are hungry and haven't eaten. Entering their kitchen, the participant is shown a 'point of view' video showing how the character struggles with microwave controls. They are provided with several paths to follow to help the character, with varying results.

This could allow a designer to experience an approximation of living with a person with Dementia in their own home, and to respond to their experiences. These scenarios can unfold over long periods of time, occasionally interrupting the participant's life at home, or as focused sequences of triggered events. Feedback from participants can be gathered, to capture their improvised responses to dealing with Dementia care situations. In addition, resulting design ideas and refinements could then be introduced into these scenarios, such that there is scope for iterations that explore the design space.

### **System Architecture**

Figure 2 represents the initial system architecture. This utilises common communication protocols (Email, HTTP requests, Android Intents) to integrate a wide range of data from sensors in the home as triggers and context to events. To date, script development has occurred through visual programming using the Automagic for Android app (<http://automagic4android.com>). While this requires some technical understanding, it provides the best identified approximation of the support needed to produce scripts in which diverse sensor data trigger various kinds of output. The ability to create complex narratives that unfold over time is achieved through variables that store state and past actions. Through experimenting with this prototype system, we can

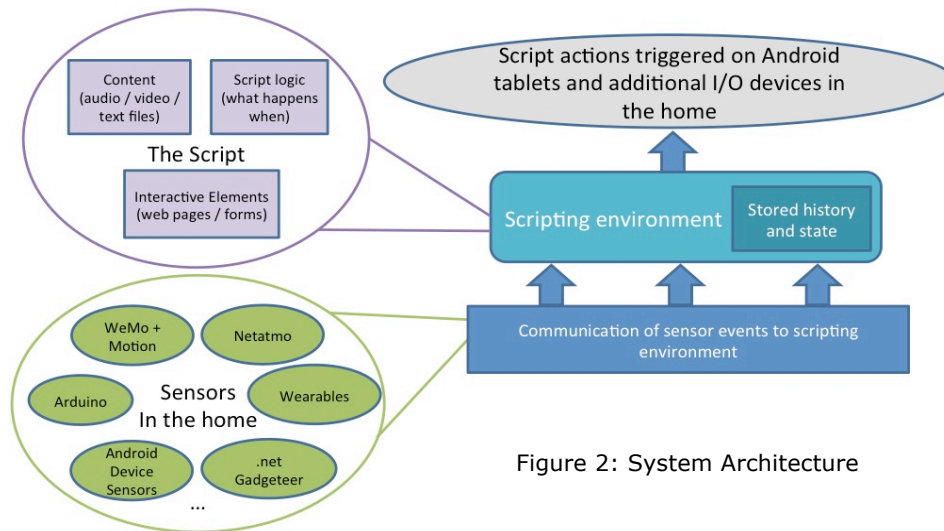


Figure 2: System Architecture

explore the potential of the approach and identify key features and difficulties in creating responsive scripts.

### Challenges and Future Work

Our exploration of responsive scripted experiences is currently focusing on how its characteristics can be best used. Through collaboration with filmmakers, actors, and designers in the Dementia care space, we are using workshops and demonstrations to identify how effective scripts can be created, and how the scripting process should be conceptualised. In order to fully connect this with design processes, we also look to include scope to introduce ideas and refinements into the experiences.

A further question is how to balance complexity and practicality in using this approach in the home. Ideally an instance of this system would have low installation costs, and perhaps in the future could utilise sensing infrastructure that is already present in homes. It is also clear that creating complex scripts for longitudinal use could require significant amounts of script writing

WHEN motion detected in living room area, play <audio/video file 1: Character complains about being unable to control TV, that it is not working>  
 THEN <turn on TV>  
 10 seconds later <turn off TV>  
 5 seconds later <turn on TV>  
 THEN <display options to participant>:  
 Show person how to use remote,  
 OR: Create a sign explaining the use of the remote  
 OR: Other response? (create explanation through video / text),  
 OR: Introduce design idea (create explanation as sketch or text)  
 THEN play <audio/video file x: response to user input>

Figure 3: A simplified portion of a script

work and content creation. At the same time, the concept of responsive characters and narratives that are played out in the home could have broader potential in areas such as entertainment.

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