Television Experience Insights from HbbTV

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ABSTRACT

In this position paper we shortly highlight the most important results from the European research project HBB-NEXT that concludes in March 2014: an ethnographically inspired user study provided many insights into the ways people use second screens; an experiment comparing gesture, voice, and remote control with Microsoft's Kinect showed that remote control still performs best, that voice looks very promising, and that gesture is useful in certain instances; an experiment with 51 participants validated four novel Social User Experience measures for the (user) evaluation of Group Recommender systems. Finally, we briefly outline our research agenda for another European research project, TV-RING, which started in September 2013. Both research projects focus on novel concepts and applications using the HbbTV Standard.

Author Keywords

HbbTV, User Experience, Multimodal Interaction, Group Recommendations, Second-Screen

ACM Classification Keywords

H.5.m. Information interfaces and presentation

INTRODUCTION

Traditional TV sets are currently being replaced by Smart TV's that use a variety of technologies and different Interaction paradigms. Game consoles act as media centers and will increasingly be able to deliver TV content. Second screens, desktop computers and mobile devices such as Smartphone's and tablets are ever more popular for watching on demand, streaming content. The question then is: How will we be able to provide usable systems, and provide positive user experiences to all users, given this diversity of systems and implementations?

In the HBB-NEXT project (http://www.hbb-next.eu), we tried to answer some of these questions. For starters, we conducted a thorough, ethnographically inspired user study into how people consume all kinds of content on any device

in the home. Then, we conducted paper prototyping sessions concerning the general design of Smart TV interfaces, and specifically looked into group recommendations [2]. Finally, we also investigated different means of interacting with the Smart TV: gestures, speech, and the traditional remote control.

In the TV-RING project (http://tvring.eu), we are continuing along this path by working on contextual recommendations in the home, and ways to offer compelling second-screen content, again using the HbbTV standard. This project will carry out large pilots in the Netherlands, Germany and Spain, each one focusing on different aspect. Our work will align mostly with the Dutch pilot.

In the remainder of this position paper we will briefly sketch some of the important insights gained in the HBB-NEXT project. Afterwards, we will provide an outlook concerning the research agenda carried out in TV-RING.

DIARY STUDY

Our first research activity in the project concerned the gathering of broader user requirements for the to-be-developed applications in the project. For that purpose we carried out a three-week diary study in 12 households in Flanders [3]. The households comprised a mix of singles, couples, couples with very young children, and larger families with children. Participants were asked to report all their TV and video watching activities, the devices they use, with whom they were watching something, and possible second-screens that were used simultaneously. After the three-week diary period, we conducted interviews with all members of the household to discuss the diary entries. Interviews and diaries were then analyzed using quantitative analysis software (NVivo), and applying a Grounded Theory approach. After this analysis a number of main categories appeared.

In this study we will focus on a small set of results. We distinguished non-program related from program-related second-screen use. Mostly, second screen devices were used not in relation to the program on TV. Some people were working and kept half an eye on the program. Other people were on social networks conversing with friends and family. This relates somewhat to the next observation: people's attention switches quite frequently between the main screen and the second screen. Even within one

program people will shift attention away from the TV screen when it is not interesting enough. Some participants explained that for the show "So You Can Think You Can Dance", they really enjoyed the dancing, but as soon as the program started looking behind the scenes, doing interviews etc. they lost interest and started doing other things. This emphasizes the importance of keeping your viewers engaged throughout the program. When creating second screen apps, it could be interesting to provide program-related content on the second screen that people can consume when losing interest in the program on TV to keep viewers engaged.

MULTIMODAL INTERACTION

For many years we have been using a remote control to interact with our television. In recent years however, other opportunities have been studied and implemented. The main methods of interaction here are speech and gesture control. For this purpose we conducted a comparison of speech, gesture and remote control, for a number of basic media task using Microsoft's Kinect together with the Xbox: navigating to a movie and play, searching for a movie and play, navigating to a song and play, and fast-forward 30 minutes into a video and play [1]. We measured task times, evaluated positive and negative elements of the interaction via a post-questionnaire with 30 users, and observed the interaction to identify usability issues with each interaction modality. Finally, after they carried out the tasks with all techniques, we asked them to provide a preference ranking.

As expected remote control performed best across the board. This had been our default way of using a TV for so many years; people really are very familiar with it. Yet, seven out of 30 people indicated that voice was their first choice. Voice control indeed performed really well. Especially for searching content, it is much better suited than either remote control or gestures. Furthermore, via voice control users have immediate access to the entire screen; using a remote control users first have to navigate left and right to get to the right item. Gestures did not perform so well. It was great for navigating to the next and previous screen using swipe gesture. The biggest downside was that people experienced fatigue up to the point some had to support their gesture arm with their other arm.

GROUP RECOMMENDER UX

Another important focus was the design of recommender systems. For many years the focus was very much on improving the accuracy of these systems. In recent years though, the focus has shifted toward improving their user experiences. For a group recommender then, it makes sense to evaluate the social user experience. Since no measures for Social UX were available, we introduced and validated four new measures in an experiment with 51 users: Social Choice Difficulty (how difficult was it for the group to agree on a choice), Anticipated Social Experience (to what extent do people expect a social experience from watching the chosen item), Togetherness (to what extent do people feel together), and Social Perceived Usefulness (how useful do people consider a group recommender for these purposes) [4].

TV-RING

In TV-Ring we are concerned with providing the right recommendations at the right time in the home. In order to achieve that we aim to map when each person's personal device is in the living room. That way we hope to determine who is in front of the TV, so we can automatically adjust the content to it. Related efforts will focus on the right user interface for such personalized, dynamic sets of recommendations. In addition, we hope to determine the appropriate time to offer recommendations – viewers enjoying their weekly show, do not have any use for recommendations at this time.

ACKNOWLEDGMENTS

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