Co-Viewing Room: Mobile TV Content Sharing in Social Chat

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Abstract

TV watching is a common leisure activity, and people often use the opportunity of TV watching to socialize with other co-watchers. However, when potential TV co-watchers like friends or family members are distributed in different locations, the social function of TV watching is disrupted. In this paper, we present a mobile TV content sharing system called Co-Viewing Room, which enables distributed users to share three types of TV content, including *whole video sharing, video clips sharing* and *snapshots sharing* during an online chat. We evaluated the system by comparing the influence of the three types of content sharing on users' experience and social interactions. Our results showed that people were satisfied with remote TV sharing support, and tended to be more responsive to lightweight shared content like snapshots and video clips. Also, people regarded snapshots sharing as a useful support for efficient social chat.

Author Keywords

Social TV; distributed content sharing; conversation support; remote communication; chat

ACM Classification Keywords

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

Introduction

TV watching is popular among individuals for various purposes, like for entertainment, relaxation, and socialization. Research has observed that family members often discuss the TV content they co-watch together [9]. Wang [12] explored how people watch TV content on traditional TVs and online video streaming platforms with an in-depth interview, and they discovered that traditional TV watching was valued more as family time and linked with companion experience. Moreover, people like to chat with friends while watching TV or discuss previously viewed TV programs [3]. TV can serve as a center for social interaction when people are at home and are co-located with its prominent physical position in a house and its ability to trigger social interaction.

With the broad accessibility to Internet, watching video with mobile devices and sharing video content are growing in popularity. People share the video they have seen to communicate their opinions and feelings with their social network [2]. However, these video sharing-related social activities take place mainly on video streaming websites, few works have investigated how TV content can be shared similarly among distributed individuals over mobile devices, and how this TV content sharing influences the social experience of TV co-viewers.

The objective of this paper is to investigate what are the effective ways to help people share TV content during a mobile social chat with three types of content sharing mechanisms, *whole video sharing, clips sharing,* and *snapshots sharing*. We present a system called Co-Viewing Room, followed by a user study for evaluating the sharing mechanisms. Two major contributions of this work are highlighted: A) A mobile TV content sharing system that allows TV sharing during a social chat is designed and built. B) We simulate the remote TV co-watching scenario in a lab study to uncover how three different content sharing methods affect the experience and interactions between co-viewers of the chat.

Related Work

Previous study on collocated TV watching showed that TV content provides a rich conversational context for audience members to discuss about [4]. People socialize with other people using their mobile devices when watching TV these days. Some interactive techniques are proposed to support collocated collaborative TV viewing with mobile devices, enhancing collocated TV viewing by sharing content from mobile to TV, and co-viewers could control display and grasp TV content on TV with mobile devices [1].

TV co-viewing has a great potential for socially shared activity and provides abundant topics for communication, but with time constraints, it is getting difficult to watch TV jointly with others in the same place [4] [7]. To counter this trend, numerous social TV applications have been built to enable remote, distributed shared TV watching experiences for social purposes, for example, providing social presence with ambient displays [7] or multi-screen to enhance TV watching experience with remote viewers [8].

Video messaging tools also become prosperous, which have enabled asynchronous communication through video sharing. Venolia et al. explored how video sharing evoked conversational interaction [11], Geerts et al. [6] investigated how the differences of video and text chat influence co-viewers' perception of togetherness and level of synchronization during video co-viewing. To move forward to social sharing in TV co-viewing context, Palviainen et al. integrated voice, text and gesture chat with emoticons on TV screen to enhance communication for remote co-viewers [10].
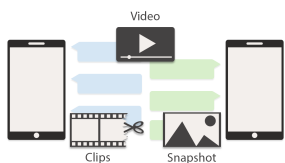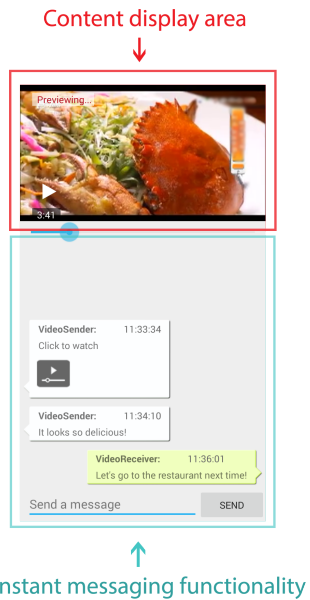

Video

Clips   Snapshot

Figure 1: In the design concept of Co-Viewing Room, users may easily extract TV content into smaller units (video clips or image snapshots) and insert these snippets into the conversational flow.

Content display area

Instant messaging functionality
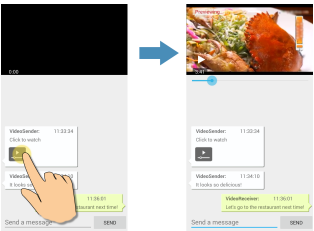
Figure 2: The interface of Co-Viewing Room.

Figure 3: Trigger the content. Users can click on the icon to make content show on the above area.

Overall, these previous work, including user studies and system designs, all suggested that sharing TV content benefits social interaction, and this TV co-viewing experience can be extended to scenarios of remote communication. So far, little attention is paid to understand the effects of different types of shared content, such *whole video, lightweight video clips,* or *snapshots*. Based on two of the sociability heuristics for social TV proposed by Geerts et al. [5], including "let users share content flexibly", and "encourage shared activities", we build a content sharing system which supports remote co-viewers to share various amount of video contents, and explores its impact on remote social chat.

System Design

Co-viewing Room
Our goal is to provide a mechanism for computer-connected users to chat with the support of shared TV content. We develop a mobile phone app called Co-Viewing Room, which allows remote users to chat and share TV content by inserting pieces of the content into the chat flow with their mobile phones.

Content Sharing Interface
The interface of this system consists of two main parts, content display area and instant messaging (see Figure 2). The content display area on the top of the screen plays the TV program that's simultaneously shown on the paired smart TV with a large screen. Because it can be fairly difficult for users to select the content of the on-going TV program on the regular large screen TVs, we decided to provide this content display area as part of the mobile app for the ease of content selection.

Once users receive a piece of content (e.g., a video clip or a snapshot) sent by others, they can see the content on the content display area. Another main interface component is the instant messaging functionality, with which users can send text messages and chat with one another. In addition, when users share content to one another, an icon (see Figure 3) will be embedded in the message bubble shown in the chat window. By clicking on it, the content shared by the sender will be displayed on the content display area above the chat window (see Figure 3). We have developed and supported three types of content sharing include the sharing the *whole video, video clips* and *image snapshots*, varying in the amount of content shared from the richest to the leanest. Next we describe the three content sharing methods in details.

Whole Video Sharing
The whole video sharing method allows users to share the complete content of the TV program with remote friends who are not watching the same program. Senders can directly send the link to the complete content of the TV program to their contacts. We also provide the progress bar that receivers can use to search for the playback time they want to start watching.

Clips Sharing
Clip sharing is to share a subsection of the TV program specified by the sender by using the selection tool of the user interface. Figure 4 shows the procedure of clips sharing. In the beginning, senders can choose the starting point and end point for the clip they want to share by dragging the two cursors on the range selection bar. After senders have chosen the clip range, they can use the "magnifier" tool to fine-tune their selection. In other words, it enlarges the chosen range of the video content visually, so that senders can modify the cursors more easily and precisely.
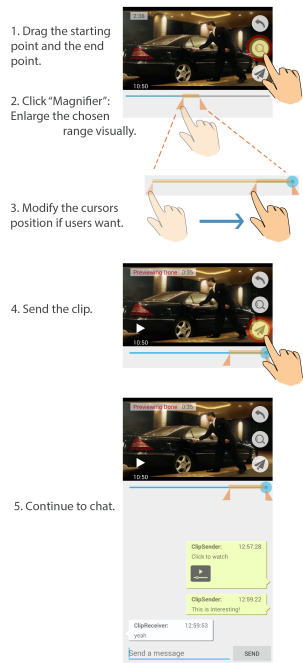
1. Drag the starting point and the end point.

2. Click "Magnifier": Enlarge the chosen range visually.

3. Modify the cursors position if users want.

4. Send the clip.

5. Continue to chat.

Figure 4: The procedure of clips sharing step-by-step. The blue color bar is the progress bar, and on the top of it, is the range selection bar in orange color.
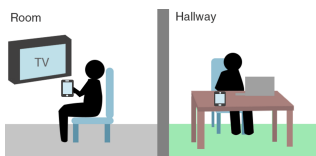

Figure 5: Experiment environment.

Snapshots Sharing

The interface of snapshots sharing and clips sharing are similar. If senders want to share a snapshot with another, they have two ways to complete the task. One way is to click the "camera" button directly to take a shot with the video on the mobile screen while the TV program is playing. The other way is that they should choose a video section with the starting point and end point like clips sharing, and then find the screen they want to take a shot. The latter way can help the senders to take a snapshot of the content that has been played.

Evaluation

Design of the Study

We compared the three different TV content sharing methods: *whole video, clips* and *snapshots* in a between-subject user study. Each pair of participants was randomly assigned to using a specific version of content sharing system (6 pairs assigned to whole video sharing, 5 for clips sharing and 5 for snapshots sharing). Participants of the same pair were separated in two different locations (see Figure 5), one was asked to perform a translation task on a laptop (to simulate a common work scenario in everyday life), another was instructed to watch TV for 30 minutes and to use the given mobile app to share content with their partners so that they won't be bored. Before the study starts, we provide an instruction on how to use the systems and set a period of time for the users to try out the systems to ensure that the participants are able to use the systems proficiently.

Materials

We selected a fixed-length video for the study and prepared another one for tutorial. To simulate the watching experience in real life, the video was extracted from an episode of a popular travel TV series in Chinese-speaking countries and inserted several commercials between sections.

Participants

16 pairs of friends aged from 19 to 25 years old were recruited in the study. We posted recruiting messages online and screened for pairs of participants who're active Android phone users, had a certain level of social familiarity with their partners of the same pair (above 3 in a 5-point Likert scale ranging from "don't know my partner at all" to "very familiar with my partner") and had experience to use mobile phones while watching TV or working. We also attempted to balance the participants for gender (14 males and 18 females).

Data Collection

The main source of data in this study is from a semi-structural interview with participants after they complete the whole procedure of the study. In this interview, we asked the participants to describe how they interacted with the other by using the given tools and their experience of how they shared TV or online video content in the past. The conversations and interface operations on the system in the experiment were logged in our database for analysis. And from the interview, we take notes to identify insights into their TV watching styles and social interaction patterns when using these tools.

Result

In this section, we summarized the previous TV content sharing experience of our interviewees first, and presented our findings of the participants' experience with the three different content sharing methods, *whole video, clips,* and *snapshots* in order.

Past difficulty in TV content sharing: During the interview, we inquired participants about their previous TV content sharing experience. Two-thirds participants self-reported that they desired to share TV content while watch-

ing TV; however, the current technology did not provide them with a good enough solution. Some tried to text or photo on instant messenger on the spot, some searched for the video on the Internet and sent the link after the TV show (e.g., "I would google the video and sent it after the show." P17), and some just forgot about it. Without appropriate sharing methods, it not only increased mental workload but also hindered their motivation to share.

Whole Video Sharing
Conversation support and trigger: One of the message senders considered the video link as a conversation support which helped enrich his expression. Ten participants mentioned that conversation sometimes started with a video link and the sender may give a description or comment to encourage the receiver to click and watch the video.

"yeah, I would comment on it, for example, I would say 'it looks tasty, I would like to eat' or something."(P11)

Longer video, lower responsiveness: The result of the interview shows that the length of the video has an impact on responsiveness much. Three participants explained if the incoming video can be consumed in a short time, they were more likely to watch it, otherwise they ignored it in most of the time, and one even pretended that they have watched it. Long video in conversation not only lowered responsiveness but also dwindled the motivation of sharing since senders also assume that receivers would not watch such a lengthy video.

"If the length of an episode is long, about 30 minutes or 1 hour, I wouldn't watch it."(P28)

Video content coordination: From observations in the experiment, we found that once an utterance referred to a specific video section was presented, the message receiver was obliged to search for the reference to match the message, and the sender had to provide more cues such as descriptions of video content or the time stamps, which added burden to the process of grounding and affected the ongoing dynamics of a conversation.

"I try to search the part by keywords he provided."(P32)

Clips Sharing
Demand for clips sharing tools: Three interviewees professed that when receiving a shared video content, they're interested in the part emphasized by the sender, no matter in their daily life or in the study (e.g., "I only want to watch the essential parts.", P19). And it also holds from the sender's perspective, six participants stated that they had attempted to stress on the key points, some attached the time point by text, some clipped the video by additional editors in advance and some professional YouTube users set the starting point of the video before they share the link. The sender's intent is to communicate with the receiver more directly without requiring extra grounding time.

More accurate clip span: A participant who is proficient in setting the starting time of YouTube videos when sharing the contents, considered that our tool, which allows people to send starting and end points, makes content selection more precisely and useful for content sharing.

"From my experience, if I only set the starting point 1 or 2 seconds before the moment I want to show, other may miss the beginning and get confused what is the point for this lengthy video."(P10)

Snapshots Sharing

Sharing TV content with photo-taking: When we asked the participants how they share TV content in their everyday life (not in the study), instead of sending text messages only, four participants reported that they would take a photo of the TV screen and share the pictures directly. Our design of snapshots sharing matches their current practice.

"If I thought the clip of the TV program was so special, I would take pictures by phone and sent it instantly."(P9)

Conversation support: Observing the behavior in the snapshot sharing condition, a sender sent snapshots in place of text as in some situations the image can be more effective for establishing a common ground than text and the cost of typing message is eliminated.

(The conversations in the experiment)
"Why so many pictures?"(P17) "It is faster."(P18)

Discussion

According to the qualitative results of our interviews, the three different content sharing methods include *whole video sharing, clips sharing* and *snapshots sharing* appeared to meet aspects of users' needs reasonably well. The design of Co-Viewing Room has provided a potential solution to distributed TV content sharing as part of remote social interactions. The length of content appears to have an impact on the users' sharing and responding behaviors. The longer the content is, the less likely users would share or respond to it. Users also reported that shared content was useful support for ongoing conversation, and they preferred simple ways to share video content, like snapshots. Lastly, we draw out some design implications for the future design of TV content sharing. Due to the relationship between the length of content and responsiveness, the appropri-

ate length of content might make the grounding process more efficiently. Choosing the precise starting and end point helps content senders to make their expression more clearly and precisely. Also, it helps content receivers to understand the crucial parts rapidly. Another implication is that users tend to make a conversation along with snapshots, which can be readily implemented and deployed in social chat tools.

Acknowledgement

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