
Co-Lighter: Promoting Video Watching by Crowd Suggestion on Specific Content

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ABSTRACT

Exploring interests and interacting with other viewers based on specific video content are the two most important factors when viewing a video. However, current video sites have not supported viewing suggestion or satisfactory communication opportunities based on video content. In this paper, we first conduct a preliminary survey among 114 participants to investigate the limits in current video watching modes. Then, based on the survey results, we present Co-Lighter, a novel tool for video viewing and comment. Co-Lighter supports viewers to watch videos and share feelings about video content in a collaborative way. Through Co-Lighter, viewers can not only easily know the heat of each clip in a video and get advice from other viewers about which parts of the video are most worth watching, but also dynamically superimposes comments over video content to share feelings with others.

KEYWORDS

Video viewing tool; Watching suggestion; User Comments; Collaborative viewing

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Table 1: Questions in the survey

Question
1 How do you feel about current video sites?
2 How long do you spend on video viewing in a day/week?
3 What do you think of the recommendation in current video sites?
4 Do you want suggestion on where to watch inside a video?
5 Do you want to watch the whole video if its length is pretty long?
6 Do you have any trouble when skip through the video?
7 What do you think of the appended comment area below the video windows?
8 What do you think of the Danmaku comment overlaying a video screen?

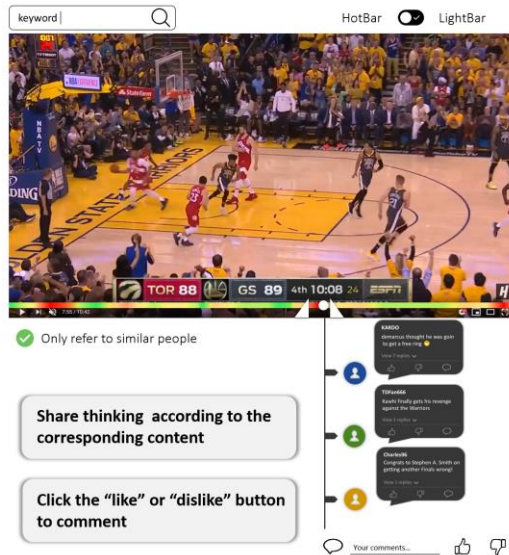


Figure 1: Overview of Co-Lighter.

INTRODUCTION

With the development of social media sites, such as Youtube, Vimeo, Snapchat, and Facebook which allow viewers to share and upload videos, a growing number of videos are available for people to view [3]. For watching videos, viewers engage in finding interests and interacting with others, which viewing suggestion and comment can benefit [9]. Viewing suggestion helps viewers explore videos in less time based on their preference [1]. And there are already some comment functions provided for viewers, such as appended comments (as an ordered list beneath a video player window [7]) and Danmaku (a style of commenting in which users' comments overlay a video to create an interactive viewing experience [4,7]). These comment modes support discussion of media [7] and discussion can help users to make more well-informed judgments about the quality of content [2]. However, there are still some shortcomings limiting people's better viewing experience.

Current video recommendation methods only support viewing suggestion on a whole video [1] while fewer approaches concentrate on suggestion on video clips [5]. Appended comments and Danmaku support viewers in searching and discovering content, choosing and experiencing videos with others [4,6]. However, Danmaku's functionality has the potential to obscure video content [4], which may distract users from engaging with the video's actual subject matter [8]. Since appended comments is not associated with time, it is difficult to link comments with specific video content [9].

To investigate the specific problems in current viewing and comment mode, we conducted a preliminary survey. According to the results, we present Co-Lighter, which provides two visual bars called LightBar and HotBar based on viewers' fondness and comments to video content. Co-lighter provides a two-side locators for viewers to locate a certain part of the video, in which viewers can give their fondness through a like/dislike button and share their opinions by comment and discussion. The fondness and comment will serve as information to update both the LightBar and HotBar. The two bars can help viewers to know the hot distribution of the video content in turn.

DESIGN CONSIDERATIONS

Pre-User Study

In order to clarify the main shortages in current video viewing mode and the overall users' needs in video viewing, we conducted a preliminary survey. The survey was based on an online questionnaire and participants were asked to freely fill in their opinions. Table 1 shows the detail questions in the questionnaire. We used an online survey so as to enable participation from more people to discover the difficulties and needs in everyday situations where watching videos.

Participants: A total of 114 people (65 females) participated in the survey. The average age was 27.65, ranging from 16 to 65 years old, and most of them (96.49%) usually enjoy watching videos.

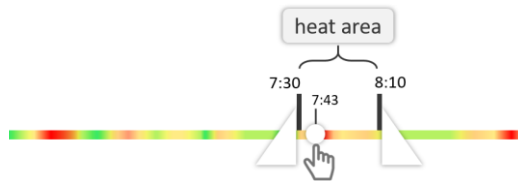


Figure 2: Smart Jump. This function will help viewers fix a position of the content properly.

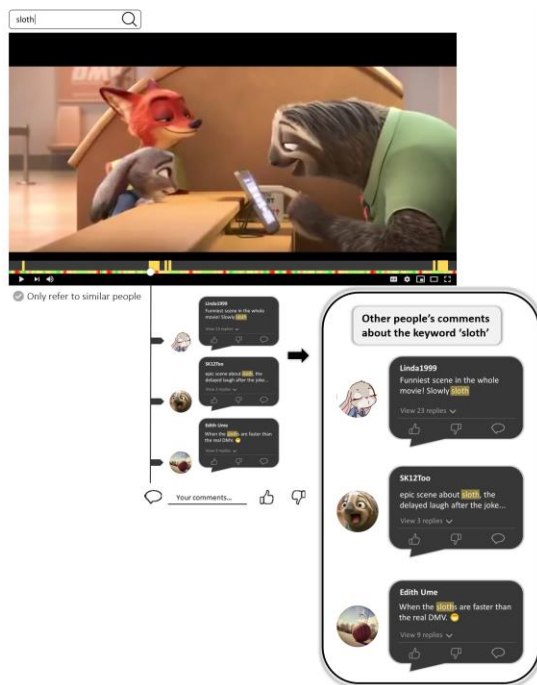


Figure 3: “Where Is the Sloth”. This function will help viewers search the video content based on others’ comments. Comments will be shown in a dynamic comment area and they get scrolled with the video playing.

The entire survey lasted about 12 minutes, and we provided total 50-dollar VIP vouchers of a popular video website to participants.

Findings

We concluded two main findings according to the questionnaire results.

1) *Users want to get suggestion on “where to watch” inside a video:* Most participants (97.36%) mentioned that although current video websites have supported video recommendation functions according to users’ preferences, but there is little recommendation for specific video content in more detailed scale. Some participants commented that when watching some species of videos, such as entertainment shows and online courses, they would rather skip some boring contents to watch than concentrate on from beginning to end. Especially, participants want to know what other viewers suggest to watch inside a video.

2) *A new comment mode should be introduced:* All participants (100%) mentioned that there are some shortcomings in Danmaku comments or appended comments. Sometimes, participants want to write a long-length review on a touching or inspiring content (69.3%). However, for Danmaku comments, it would occlude the video content and hurt the experience viewing videos when the Danmaku is intensive, and Danmaku only permits limited words. For appended comments, it is difficult to link comments with specific video content since it only supported an overall review about the video.

DESIGN OF CO-LIGHTER

The main differences to the existing video sites are a renewed viewing mode and comment mode. Figure 1 shows the overview of Co-Lighter.

For viewing, Co-Lighter provides LightBar and HotBar which have the same length with the traditional progress bar. The LightBar is formed with a linear heatmap which is the distribution of viewers’ fondness (like/dislike number) and the HotBar is formed with another heatmap which is the distribution of the number of viewers’ comments. The same with progress bar, LightBar and HotBar can be dragged from left to right to selectively view the video. Every part in LightBar represents the fondness of viewers to the video content in the period. Similarly, every part in HotBar represents the heat of viewers’ discussion on the video content in the period. Every user can show her fondness towards certain video content and a user can see all others’ reviews. Users can switch the two bars through a toggle button (upper right in figure 1).

For comment, viewers can select a certain video clip and share their thinking according to the corresponding content with an unlimited word. The key widget to support the certain content selection is a two-side locator on the progress bar. A viewer can drag the two sides of the locator to select a period of the video. After that, she can see what other viewers comment on the content instead of on the whole video. Besides, she can click the “like” or “dislike” button to express opinions towards the video content or others’ comments and write a comment on the current content or reply to other viewers’ comments. Since the proposed comment mode supports a longer comment than Damaku comment, we provided a dynamic comment area to show the reviews of

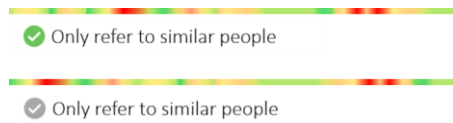


Figure 4: Similar with Me. Users can use this function selectively by ticking the button below the video window. LightBar/HotBar formed by different viewers' data can be significantly different.

Consider a scenario:

Susan came home after work and wanted to watch her favorite TV show called Ellen Show before dinner. Its episode was about 40 minutes long, but in less than half an hour, Susan needed to cook for her family. "Let me see what is in the heat area", Susan thought and jumped to 05:30 according to the LightBar because the heat in that period was extremely deep. It was a humorous dance time which made her feel relaxed, "No wonder the LightBar (of this part) is so red." Susan then explored the show in other parts according both the LightBar and HotBar. It only took 20 minutes to watch the video with the viewing suggestion from other viewers. So, Co-Lighter can not only provide suggestion from others, but also save viewers' viewing time.

the current content, which will automatically scroll with the switching of video content. If a viewer is interested in a comment, she can move the mouse on it and the comment will be fixed until she finishes browsing and move away the mouse pointer.

In addition, we have designed three optional functions to better support Co-Lighter.

Smart Jump. It's not easy for users to drag LightBar/HotBar to jump to the beginning of a heat area. Because only with the heatmap on the HotBar, users can not clearly know the exact start time of certain content. So we provide intelligent video jump for users to navigate to a certain part of the video as they drag the LightBar/HotBar to a heat- point. (For example, If the user drags the bar to the 7:43 position, we will automatically play the video clip related to that point (For e.g. from 7:30 to 8:10) automatically). We segment the video implicitly by taking use of the video clip users selected when they express their opinions and locate the two-side locator. Note that there may be overlap among different viewers. For example, Jack thought the video clip ranging from 7:58 to 9:15 is interesting, but for Lucy it is from 8:00 to 9:14. To solve the problem, different video clips are combined to a consistent one intelligently by majority voting and neighboring methods. It is worth mentioning that our video segmentation will be updated in real time with the use of co-lighter. The more users comment on the video, the more accurate our video segmentation.

"Where Is the Sloth". Sometimes, users may want to search for content based on others' reviews or comments. For example, a sloth is the key role in a movie. Before watching the movie, Mary is recommended to watch the scene where the cat first come on stage, but Mary does not know the certain time. So we provide a search assistant function based on other viewers' comments that allows users to search for other people's comments or discussion by typing a search keyword in the search box. Obviously, a search keyword may relate to multiple comments which may appear in different locations of the video. We highlight the location where all the comments appear on the HotBar (shown in figure 3), and users can choose to jump to the corresponding video clip based on a retrieved comment.

Similar with Me.: We will use collaborative filtering methods to discover similar users and display the LightBar/HotBar formed by the fondness and comments from similar users. We measured the similarity of the users who watch the video by counting the number of the same video clips where users share comments or fondness. This feature is optional by allowing users to tick the "Only refer to similar people" button (shown in figure 4).

CONCLUSION & FUTURE WORK

In this paper, we present a preliminary survey to investigate existing shortages in current video sites and based on the results, we design a novel video viewing tool, Co-Lighter with a LightBar and a HotBar. Co-Lighter can support viewers to get viewing suggestion from other viewers when watching a video and provide a new comment mode which permits users commenting on certain content without word limit. In the future work, we will design a user study in a real video viewing scenario to evaluate the effectiveness of Co-Lighter and get feedbacks from users, and we will extend this research to further investigate how to promote users' viewing experience in a more collaborative manner.

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