

Usability and Use of SLS:Caption

Deborah I. Fels
Ryerson University
350 Victoria St.
Toronto, CANADA
+1 416 979 5000

dfels@ryerson.ca

Martin Gerdzhev
Ryerson University
350 Victoria St.
Toronto, CANADA
+1 416 979 5000

mgerdze@ryerson.ca

Janice Ho
Ryerson University
350 Victoria St.
Toronto, CANADA
+1 416 979 5000

janice.ho@ryerson.ca

Ellen Hibbard
Ryerson University
350 Victoria St.
Toronto, CANADA
+1 416 979 5000

ehibbard@ryerson.ca

ABSTRACT

SLS:Caption provides captioning functionality for deaf and hearing users to provide captions to video content (including sign language content). Users are able to enter and modify text as well as adjust its font, colour, location and background opacity. An initial user study with hearing users showed that SLS:Caption was easy to learn and use. However, users seem reluctant to produce captions for their own video material; this was likely due to the task complexity and time required to create captions regardless of the usability of the captioning tool.

Categories and Subject Descriptors

H.1.2 [User/Machine Systems]: Human Factors

General Terms: Design, Human Factors.

Keywords: Captioning, captioning tools, sign language online

1. INTRODUCTION

Sign languages such as American Sign Language (ASL) are used by a majority of deaf individuals in Canada and the USA [2]. One of the difficulties with learning and using sign language is that sharing requires face-to-face interaction. With the advent of applications such as YouTube and inexpensive, high speed connectivity and hardware, video materials have been made much more available and easy to retrieve, upload, and play. As a result, deaf people are beginning to use video logging (vlog) sites to share their thoughts using sign language. With the increased prominence of deaf voices and contributions online comes an increased interest from hearing audiences to understand and consume these contributions

One common method of making video material more accessible is through captioning. Although captioning is typically directed at a deaf or hard of hearing audience, hearing audiences often use captions for learning languages and watching television or films in noisy settings such as pubs or gyms.

There are at least 20 different free or inexpensive captioning or subtitling applications available for creating online captions or alternate language subtitles for video material. However, all of these applications have been designed for a hearing, text-centric user whose first language is usually the language used in the software interface. Captioning options are also often limited to those that have been standardized for television captions (such as mono coloured and sized fonts at the bottom of the screen on a black background) even though modern computers have extensive graphical display and processing capabilities.

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ASSETS'10, October 25–27, 2010, Orlando, Florida, USA.

ACM 978-1-60558-881-0/10/10.

Having a captioning tool that employs a graphics-centric interface as well as allows caption properties such as size, colour, placement and background to be adjusted may offer deaf vloggers new opportunities to make their ideas more accessible and understandable to a hearing audience. In addition, it may also offer hearing captionists alternative and perhaps simpler methods for generating more expressive captions. In this paper, we present the captioning functionality that has been incorporated into a sign language web editor, SignLink Studio, and initial usability results with hearing users.

2. SLS:CAPTION

SignLink Studio (SLS) is an authoring tool that allows sign language users to create sign language-based web pages by marking up video files with sign language based hyperlinks called "signlinks" [1]. Caption functionality (SLS:Caption) is contained within this tool.

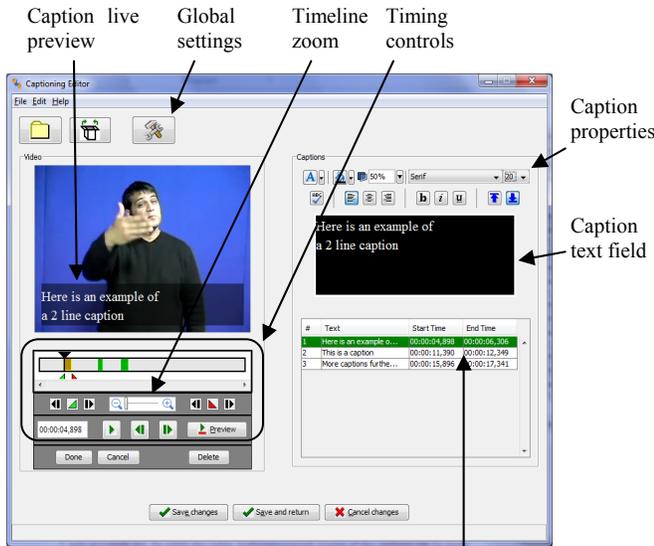
The goal of the SLS:Caption tool is to allow users to create captions for on-line sign language video or video with sound. SLS:Caption uses an interface that is congruent with the SLS authoring interface in order to take advantage of learning that authors have already accomplished and to maintain the visually-centric design that is preferred by sign language users (Figure 1).

The SLS:Caption interface consists of two main components: video and caption editor. The video component contains the video, which also shows a live preview of the caption being entered or edited, and playback controls for navigating within the video and a text-box that displays the current time in the video. The density bar, apart from its normal function of providing non-linear navigation in the video, also displays information about caption timing. A timeline zoom slider allows users to view captions in greater detail so that when many captions exist on the density bar, the user can differentiate between them by zooming into one specific portion of the density bar.

When a new caption is added, or an existing caption is selected for editing, the duration of the start and end time of the caption are manipulated using a similar process to setting the duration of a signlink in SLS. The start and end time as well as the position and length of each caption can be adjusted frame by frame or, less exactly, using two draggable sliders.

The caption editor contains three groups of controls: caption properties, a text area for entering caption text, and a table that lists all the captions. Caption properties include buttons for changing text and background colour, as well as drop-down slider for modifying background opacity that are applied to the currently entered or selected caption.

Font and font size drop-down menus as well as text alignment buttons allow users to adjust the various properties of caption text. Settings allow users to align the caption text horizontally left, center and right as well as to position the caption at the top or bottom of the video. Per caption spell check functionality is also provided.



List of captions. Currently edited one is highlighted.

Figure 1: SLS:Caption tool

While it may be useful to be able to edit text preferences for individual captions, it may also be desirable to apply a specific preference setting to all captions for an entire video (e.g., text colour). A global preference editor was developed that allows text colour, background colour and opacity, text alignment and position on the video, font family, and size to be set globally.

The list of captions shows all the captions that have been generated for a video with their corresponding start and end times. The currently selected caption is highlighted in green when being edited or in blue when just viewing. When editing a caption, the start and end time can also be set numerically in the table instead of adjusting them with the graphical timing controls.

3. CAPTION USER STUDY

Two iterations of a user study were carried out to determine the ease of use and learnability of SLS:Caption for novice captionists. Although SLS was designed as a sign language-based web editor, it was not limited to videos containing sign language; any video material can be used. As a result, our first study involved only hearing users captioning film content.

Twenty-three hearing people participated in two iterations of the usability study. In iteration 1, there were 12 participants (seven male, five female). In iteration 2 there were eleven hearing participants (eight male, three female).

A t-test was carried out between the two iterations to examine differences in responses to the questionnaire. There were no significant differences for any question. However, the descriptive

data does provide some insight into the opinions of participants. In all but one question, all participants from both studies found all aspects of the system either somewhat easy or easy to use.

The only question which had even moderate differences involved setting the in and out timing points. As observed, participants in iteration 1 were confused in setting the time in and out points because it was difficult to gauge the start and stop times of the caption. There was no visual indicator of when the dialogue began or ended. As such, participants played the clip multiple times to determine the length of each caption. Participants also had to select the Edit button each time they wanted to make timing changes, likely adding to the difficulty of setting the time in/out for the caption. This functionality was modified prior to iteration 2 so that when a participant selected the caption text it was automatically engaged.

In iteration 2, there were no comments regarding the Edit button. Two people made comments about the timing, but more in relation to trying to be accurate rather than the operation of the timing buttons. As such, it seems that changing the edit functionality improved participant's ability to manage the time setting procedure as well as the text editing functions.

Positive aspects that people listed in the open ended comments of both iterations included the ease, flexibility and ability to format the captions. Participant also reported that the interface was easy to use for text entry and editing. A surprising result was obtained when participants were asked whether they would use the software to caption their own video material intended for an online audience. In both iterations, most participants said infrequently. Even though users found the software easy to learn and use, and did not have many difficulties completing the tasks, they still did not want to caption their own videos.

SLS:Caption has also been designed for deaf users to caption their sign language video materials if they want to make them more accessible to hearing viewers. Again, there is no legal mandate compelling deaf web authors to make their videos more accessible, and the time and effort required to generate captions may be excessive. The next step in our research is to evaluate SLS:Caption with deaf users, assessing the ease of learning and use of the interface. We are also interested in determining what is required to motivate users to caption their video materials and how that can be achieved with the high levels of accuracy and synchronization expected from viewers.

4. ACKNOWLEDGMENTS

Our thanks to Canadian Heritage, On-line Culture Program, NSERC and SSHRC for generously funding this project. We also thank the participants for giving their time for our study

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