A New Online Video Editing Tool

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Abstract: - We have implemented an online video editing application named NTUST Online Video Editing Tool (NOVET). It allows the user to edit video content through a Web browser, and makes a blogger able to post videos. This paper introduces the user-interface, functionality, and software architecture of NOVET. Comparisons with other similar tools are given to show the merits of NOVET. The merits of NOVET include that NOVET can record videos or only audios through the Web browser, while the others cannot. When compared one on one, NOVET has three or more features than any of the others.

Key-Words: - Audio, Blog, Online, Video editing tool, Web browser

1   Introduction

An online video editing tool allows the user to edit video content through a Web browser, and makes a blogger able to post videos. Such a tool is composed of two parts. One is for video management, which is responsible for playing videos, recording videos, and integrating videos into blog posts. The other is for video editing, which is responsible for cutting videos, merging two or more videos into one, and modifying only the audio part of a video. We have implemented an online video editing application named NTUST Online Video Editing Tool (NOVET). This paper introduces its user-interface, functionality, and architecture. Comparisons with

other similar tools are also given to show the merits of NOVET.

This paper is organized as follows. Section 2 introduces the interface and functionality of NOVET. Section 3 presents the software architecture. Section 4 compares the functionality of NOVET with those of four other similar applications. Section 5 concludes this paper.

2   NOVET interface and functionality

The video management window of NOVET is shown in Fig. 1. On the left side, three basic functions of

Fig. 1. Video management window of NOVET.

video management are given. The Record Video button can be clicked to record a new video. This function allows the user to use the webcam and microphone attached to the client computer to record videos. Fig. 2 shows that a video has been recorded. The user can now type the file name and store the video at the server. The Upload function is to send a video from the user's computer to the NOVET server. The Blog button can be clicked to enter the blog mode to post new content.

To the right of the three buttons shows some information of four videos. For each video, the title is shown in the northwestern corner. Below the title is the first frame of the video. To the right of this frame is a space for a short description of the video content, including the optional textual description and the system-provided last edited time. Below the image is the video duration. At the bottom are three buttons for editing the video, downloading the video from the server to the user's computer, and deleting the video from the server.

The video editing of NOVET contains the following six functions:

(1) The user can add audio clips to a video. Fig. 3 shows a window for this function, which appears when an Edit button as shown in Fig. 1 is clicked. Its left part, from top to bottom, contains the video title, video screen, and the rest that is related to the point in time for adding audio. As it shows, the title is "singapore." The Add Audio at Time field shows that when the video has played 5 seconds, the Get Time button is clicked to give the point in time at which audio is to be added. Another way to fill in the Add Audio at Time field is to drag the triangle at the bottom to display the video content and the point of time for adding audio.

Next, we introduce the right half of Fig. 3, from top to bottom. We can select the audio source for adding to the video by three possible ways. The Select button is for using an existing audio file at the server. The Extract from Video button is to extract audio from the current video and save as a new audio file for later use. The Record button is for recording sound by using the microphone. If the Select button has been used to choose an audio file, then the Selected Audio field below shows the audio file name.

Then, we can specify the start and end times of the selected audio file for adding to the video. The two triangles beneath the gray bar can be dragged to specify the two points of start and end times in the audio for extraction.

Three dimmed buttons then follow. They will not be dimmed when they are valid for selection. The Hear Your Selection button is for playing the triangles-specified segment of audio. After clicking the Hear Your Selection button, the other two buttons Get Start Time and Get End Time are clicked to obtain the precise points of start time and end time, and display the times in the two fields below.
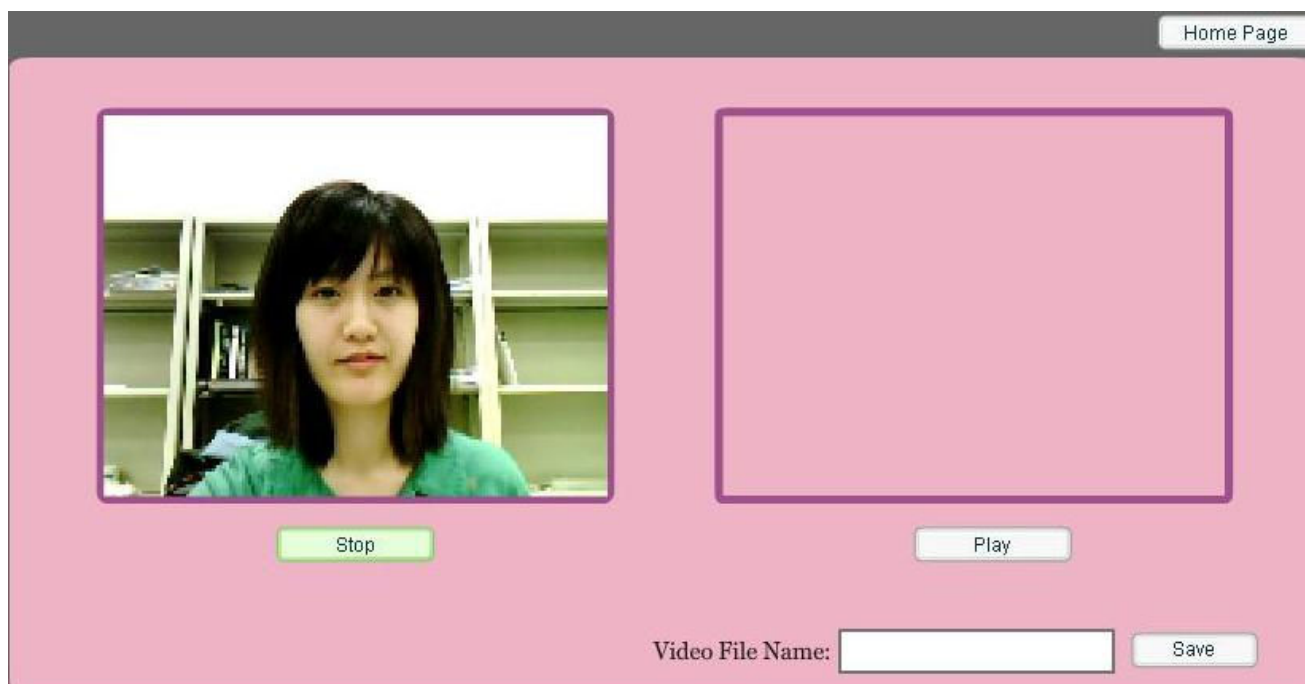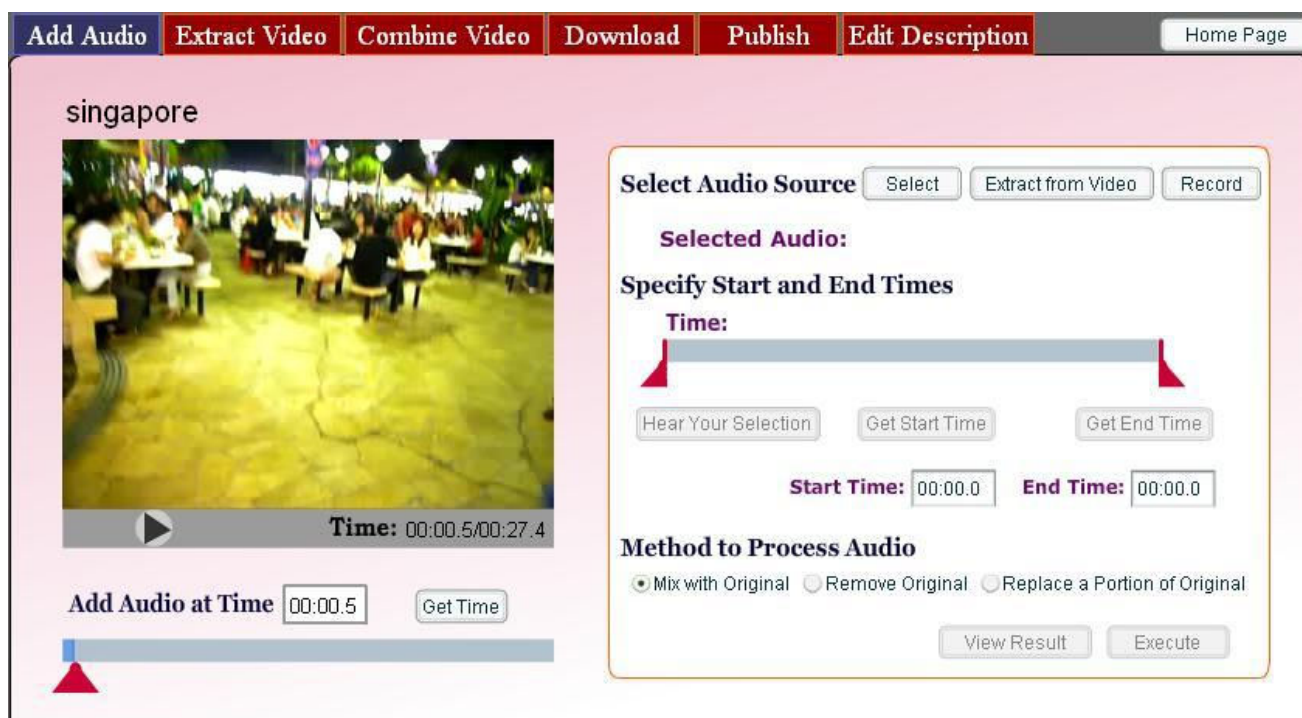

Fig. 2. Window for recording videos.

Fig. 3. Window for adding audio.

Finally, we can choose one of three possible methods to process the extracted audio. Mixing the new audio with the original audio is one way. Alternatively, the original audio can be totally removed and replaced. The third method is to replace only a portion of the original. If the third is chosen, when the duration of the added audio is shorter than that of the replaced portion, the user can choose to repeat the added audio until the end of the replaced portion is reached. On the other hand, if the added audio is longer than the replaced portion, the added video will be cut to fit in.

After all the above are decided, the View Result button can be clicked to view the video with the added audio. If the user is satisfied with the result, the Execute button can be clicked to generate a new video file.

(2) The user can specify the start and end times to extract a portion of video and save it. This function is for cutting unwanted portions of a video.

(3) The user can combine multiple videos into a single one. Fig. 4 shows a window for combining videos. On the left side from top to bottom, one can see the video title, the video screen, and the progress bar. On the right side, one can see two file name list boxes. Files shown in the left one can be selected to appear in the right one for merging.

(4) Video files can be downloaded from the server in six formats: FLV, WMV, AVI, MOV, MPEG-1, and MP4.

(5) Any video and its textual description can be posted to a blog.

(6) The description of a posted video can be modified without using the blog mode.

3 Architecture

NOVET is based on the multitier architecture, as shown in Fig. 5. On the client side, the user uses a Web browser to communicate with the server and display the user-interface.

The server side is much more complicated. It contains the following software components:

(1) Apache HTTP Server [5]. It is the main software on the server side that communicates with the Web browser. It passes the information received from the Web browser to Video Editor or WordPress MU [3].
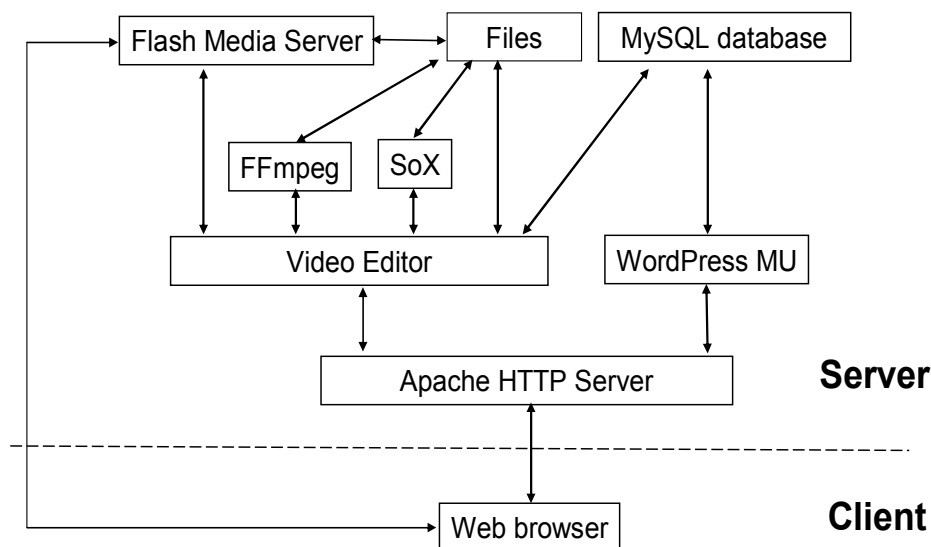
Fig. 4. Window for combining videos.

Fig. 5. NOVET software architecture.

(2) Video Editor. After receiving data from the Apache HTTP Server, Video Editor can save video data as a file or save textual metadata to the MySQL database [1]. Conversely, Video Editor may retrieve a video file or metadata from the MySQL database, and then send to the Web browser through the Apache HTTP Server. When the user performs the video editing function, Video Editor will use FFmpeg [2] to process video and save as a video file. When the

user performs the audio editing function, Video Editor will use SoX [10] to process audio and save the result as an audio file. This editor is implemented in PHP and Flash.

(3) FFmpeg. This video processing software can perform video format transformation, cutting, and combining. The result is sent back to Video Editor and saved as a video file.

(4) SoX. This audio processing software can perform audio mixing, cutting, and combining

based on the audio and related instruction it receives from Video Editor. The result is sent back to Video Editor and saved as an audio file.

(5) Flash Media Server [8]. When the user does video recording, Video Editor will ask Flash Media Server to establish connection with the Web browser; thus, the Web browser can send the video data to Flash Media Server, and the latter can save the data in a file. It can also create streaming video from a video file for the user to view the video on the Web browser.

(6) WordPress MU. It is for blog posts of text. After receiving blog content from the Apache HTTP Server, WordPress MU can save it to the to the MySQL database. It can also retrieve data from the MySQL database for the Apache HTTP Server to send to the user.

(7) MySQL database. It is a textual database for storing blog content.

4   Comparison

Comparisons of functionality of NOVET with those of International Remix [9], Photobucket [7], One True Media [6], and JayCut [4] are summarized in Table 1. NOVET is the only one that can add a selected part of audio to a video. In addition, it can record a video or only audio through the Web browser, while the others cannot. NOVET is the only one that includes all the features listed in Table 1.

5   Conclusions

In this paper, we have presented an online video editing tool. It can be useful for bloggers to post videos. We have introduced the interface, features, and software architecture. Comparisons with four similar applications have also been presented. NOVET is the only one that includes all the features compared.

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[4] JayCut, Your Video Editor – Online, http://jaycut.com/
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Table 1. Comparisons of online video editing applications.

Application / Feature	International Remix	Photobucket	One True Media	JayCut	NOVET
Cutting video	Yes	Yes	Yes	Yes	Yes
Combining videos	Yes	Yes	Yes	Yes	Yes
Adding audio to video	Yes	Yes	Yes	Yes	Yes
Adding audio to video at any point of time	No	No	No	Yes	Yes
Adding selected part of audio to video	No	No	No	No	Yes
Online video or audio recording	No	No	No	No	Yes
Format transformation	No	No	Yes	Yes	Yes
Downloading	No	No	Yes	Yes	Yes
Posting videos to a blog	No	Yes	Yes	No	Yes

[6] One True Media, Your Life, Perfectly Mixed, http://onetruemedia.com

[7] Photobucket, Image hosting, free photo sharing and video sharing at Photobucket, http://www.photobucket.com/

[8] W. Sanders, *Learning Flash Media Server 3*, O'Reilly Media / Adobe Dev Library, 2008.

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[10] SoX – Sound eXchange, http://sox.sourceforge.net/