

Java Recorder

A Tool for Cross-Platform Audio Recording and Video Transcoding

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Background

Voices Heard Media is a company that provides new ways for traditional media outlets to interact with viewers, primarily on the web. One of the ways they do this is by providing a site where TV viewers or radio listeners can submit questions to a particular show, media personality, or interviewee. Questions posted by viewers are visible to all who visit the site, and subsequent viewers can “vote up” or “vote down” other peoples' questions. The more popular a question is (the more it is voted up), the more likely it is to be answered on air. The following is an example of Voices Heard Media's question widget, where users can submit a question, view questions that other users are asking (and their corresponding answers) as well as vote up or vote down other users' questions.

FAQ How to use the Fan's Press Pass Login More Help
Ask Voices Heard Media your questions about how to use the Fan's Press Pass [Details](#)

ASK IT!

Recent Hot Popular

How do I ask a question?
VHMuser (About 9 months ago)
[SEE ANSWER](#) 8 0 0

How do I change my email address or other user preferences?
VHMuser (About 9 months ago)
[SEE ANSWER](#) 2 0 0

How can I increase the chances of getting my question answered?
VHMuser (About 9 months ago)
[SEE ANSWER](#) 2 0 0

WHAT DOES VOTE THIS QUESTION UP MEAN, THAT I AGREE?
Baffled (About 2 months ago)
[SEE ANSWER](#) 1 0 0

ENTERED MY USERNAME & PASSWORD, TELL ME WHY
Questions: 41 Votes: 7 Powered by Voices Heard Media™

Voices Heard Media's clients are media outlets who want to use this technology to increase the role that their viewers play in directing a broadcast. These media outlets (talk show hosts, TV personalities, etc.) can instantly respond to questions posted by viewers by writing a text answer in response to a question, or by posting video responses. Either will be visible to any subsequent viewers who choose to see the answer to a particular question. Video responses are published in Flash video format (FLV), and are viewed using a Flash video player embedded in a web page. From this widget, a video response would play when a user chose “See Answer”.

Motivation

Voices Heard Media has a need for their clients to be able to quickly answer questions posted by users. In order for the process to be as seamless as possible, ideally a video or audio answer could be clipped right out of the stream of a show by a talk radio host or producer and be immediately posted to the website. The Java Recorder tool focuses on the audio part of this problem. The envisioned use of the Recorder at a high level is as follows: say a sports talk radio host is interviewing an athlete, and listeners are posting questions that they have for this athlete to the show's question widget. The host can choose to answer a question by clicking on it, which opens the Recorder tool. He can then ask the athlete the selected question, and begin recording. At the end of the athlete's response, the host chooses to stop recording with one click, and with the next, upload the athlete's response to Voices Heard Media's server, where it is instantly viewable by any user who chooses "See Answer" for that question. The host can conduct an entire interview in this way, selecting popular user-voted questions and uploading the answers as the interview progresses.

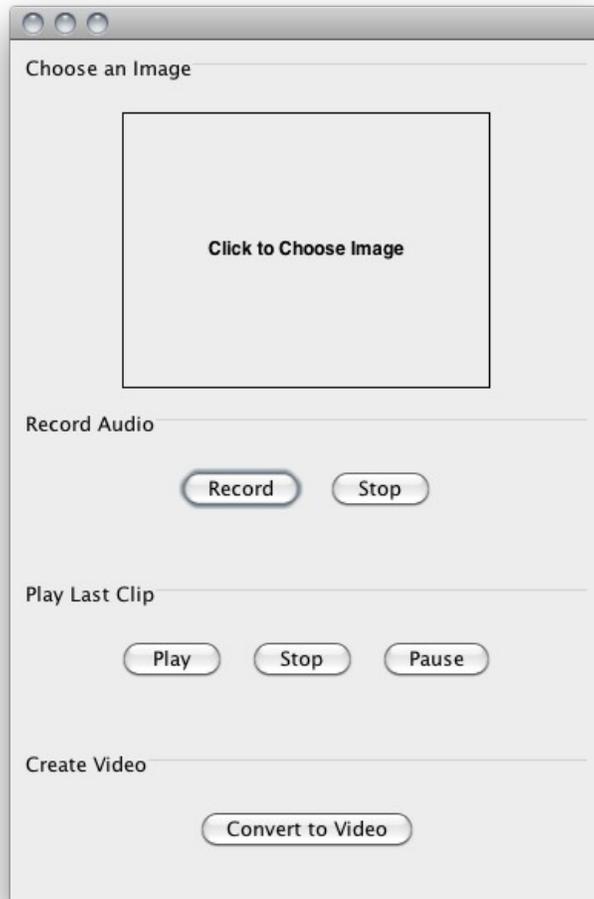
Features

For the purpose of demonstration, the Java Recorder tool is distributed as a JAR containing all the libraries and binaries required to run on Windows, OS X, and Linux (with the requirement that the Linux system must have mencoder installed, part of the MPlayer suite of tools). The final output is a Flash video file, placed in a user-selectable output directory. In real-world use, the tool will be launched from Voices Heard Media's question widget as a Java Web Start program taking a question ID as input, and outputting a Flash video file that is posted to Voices Heard Media's server along with the question ID, so that the video response can be associated with the correct question.

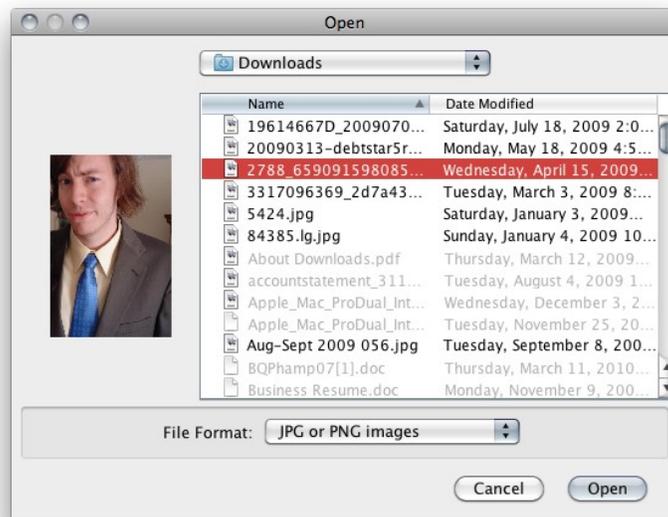
The first time a user runs the Recorder, he'll go to the Preferences pane to select the hardware to be used for recording and playback, as well as the sample and bit rates at which audio will be recorded, and the directory to which the final Flash video will be output. Otherwise, sane defaults will be chosen.



All of the preferences selected are persistent across multiple uses of the program by making use of the Java Preferences API. The size and placement of the program on the desktop is also remembered, so that once the program is configured, the user can quickly begin using the program without any further configuration.



This is the main window of the Recorder. Swing widgets are used throughout, so the appropriate look and feel is maintained on Windows, OS X, and Linux. The first task in creating a video is to choose an image, either by clicking in the “Click to Choose Image” box or selecting File → Open Image...



This image will be the video portion of the Flash video that is produced in the final step. Any PNG or JPG image can be used, and will be automatically resized (without modifying the original image, of course) to the size required by the web embedded Flash video player. The image chooser uses the Preferences API to remember the directory last used for images, so the user can quickly access oft-used icons or avatars that relate to the topic of the response.

Next, the user can begin recording by clicking the “Record” button on the main screen. In common usage, the user may select Record immediately and then choose the image while the recording is in process, due to the multithreaded nature of the program. A red icon appears to remind the user that recording is in progress:



Now the user clicks stop, and can optionally play back the last clip recorded using the “Play”, “Stop”, and “Pause” buttons in the “Play Audio” section of the main screen. Playback is also accompanied by a red confirmation icon, and--like the recording process--playback runs in a separate thread, so that other tasks (even recording) can be accomplished while audio is being played.

The final step is to create a video using the “Convert to Video” button. This won't work unless the user has selected an image and recorded an audio clip. When the conversion process starts, it launches a thread to make several calls to mencoder, while displaying a progress bar to let the user know that work is still going on. Depending on the length of the audio clip and the speed of the system, it may take 1 to 2 minutes to create the final Flash video.

The video conversion process happens with three calls to mencoder. If using Windows or OS X, the appropriate mencoder binary is decompressed from the JAR and copied into the temporary file system, where all working copies of files are stored by this program (and deleted on exit). On Linux, mencoder is detected by searching the PATH when the program is launched, and if it is not found, a request to install mencoder is displayed and the program exits. The first call to mencoder takes the user selected image and creates an AVI in which every frame is the user selected image. The second call takes the uncompressed audio that the user recorded, and combines it with the silent, still video created in the first call. The third call takes this uncompressed video and transcodes it to Flash video format, which results in a video that is about one tenth the file size of the original. This Flash video is then copied into the directory selected by the user in the configuration step.

Future Work

The most immediate future work would be launching the JAR through Java Web Start, and uploading the final video to Voices Heard Media's servers instead of simply storing it locally. Less pressing work includes a few more features related to the recording and playback of audio, for example, the ability to adjust the level of microphone input from the Preferences panel instead of requiring it to be set through the system control panel, or a full-featured playback section with non-linear editing.