VideoANT: Extending Online Video Annotation beyond Content Delivery

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“Video allows students the ability to review their work and to correlate portions of their captured performance with any formative feedback they might receive from an instructor or peer.”

Abstract

This paper expands the boundaries of video annotation in education by outlining the need for extended interaction in online video use, identifying the challenges faced by existing video annotation tools, and introducing VideoANT, a tool designed to create text-based annotations integrated within the time line of a video hosted online. Several features will be described regarding the design and development of this solution, and additional uses for which VideoANT has been adapted will be outlined.

Keywords: Video Annotation, Educational Technology, Online Video, Instructional Video

Educators and researchers agree that video can be used as an effective means to capture and review students’ presentations or performances (Broady & Le Duc, 1995; Garrison, 1984). Video allows students the ability to review their work and to correlate portions of their captured performance with any formative feedback they might receive from an instructor or peer. The educational activity of reviewing one’s own speech has shown improvements in public speaking skills such as increased eye contact, reduced use of crutch words, and greater attention to body positioning (Quigley & Nyquist, 1992). Some researchers have explored the effects of viewing one’s speech videos on students’ communication apprehension and competence (Dupagne, Stacs, & Manno Giroux, 2006). The experience of providing constructive feedback through a video-based peer review process has the potential to benefit students’ public speaking in terms of improved speaking skills, increased speaking confidence in the classroom, and increased comfort using technology for academic purposes.

Performance Capture Process

Although the benefits of using video equipment to capture a student’s work is compelling, there is a large amount of planning and preparation involved in the capturing, processing, storing, and delivering of that content to the students. Once that work is completed, additional time and resources must be invested in reviewing and assessing the student’s work, and providing feedback to the students in a timely manner. The overhead involved in this process is enough to turn many instructors away from teaching with captured video.

Advances in technology have helped in reducing some of the burden presented by capturing and storing video content for online delivery. This has been done through the addition of cameras that record to web-ready digital formats right from the device. Even with these advances, reviewing the performances and providing feedback is still very time intensive, and can often mean a student will not receive that feedback until they have already delivered their next presentation. Although receiving feedback late still...
has value, having it in time to prepare prior to delivering their next presentation could offer substantial performance gains for the students.

Peer Review through Video Annotation

In response to this need, an online video annotation tool, VideoANT, was designed and developed to allow students the ability to add time-marked text annotations to peers’ video recordings. To use it, students are placed in cooperative pairings to share formative feedback with one another. They start by reviewing a classmate’s video presentation while using the tool. They then use the tool to provide each other with annotations referencing both the content and the delivery of their peers’ presentation by linking those annotations to specific instances in the synchronized video. In addition, the instructor can add feedback on the same project, providing additional support for the performer. This step produces additional learning opportunities for the reviewing peers by adding comments and discussion points they may have previously missed.

This article discusses the strengths and weaknesses of current online video annotation tools, the decisions made during the design process, the three key elements addressed through the development of VideoANT, its current uses, and its future applications.

Review and Needs Assessment: Existing Online Video Annotation Tools

Before developing VideoANT as a solution for providing annotated feedback to peers, a thorough investigation of current online annotation tools was completed for two purposes. The first purpose was to see if a tool existed to fit the basic criterion to complete this project; the second purpose was to review each tool individually to better identify the strengths and weaknesses of each. In doing so, a foundation of good concepts and bad approaches was recorded and compiled as a starting place for the design of an in-house tool—if such development was deemed necessary. When researching current online annotation applications, each was reviewed in light of three major needs for this project:

1. The tool must be developed to accommodate large amounts of text in an annotation without obscuring the learner’s review of video content.
2. The tool should allow for the playback of video content in synchronization with the users annotated text.
3. The tool must be designed with simple efficient functionality for learners with varying degrees of technology experience. Further detail on this can be found in the Designing VideoANT section of this article.

There were multiple solutions online similar in scope to the project outlined, but none of these systems met all three of the criterion above. A sample of the online annotation systems reviewed for this project is included in Figure 1.

Although the tools mentioned above include the functionality to create annotations that supplement online video content, they rely on overlaying text on top of the video in order to add emphasis to certain areas of the video playback window itself. The designers of these tools may have done this with the intention of it being an interesting effect for viewers (the actual reasons are unknown), but when text is presented on top of the video, it prevents users from seeing both the video and comments without impairment. For example, both Youtube© and Mojiti© allow a user to turn the text layer off in order to better see the video, this defeats the author’s purpose of providing an annotation in the first place. Further, the layering of text over the video limits the length of a comment to a limited number of words. This is a direct result of the online video tools restricting the video size to a relatively small area in order to conserve bandwidth in addition to storage space on their servers. While the shortfalls of each tool were observed above, their strengths were also noted, and are covered in the section titled The Development of VideoANT following the design process.

Designing VideoANT

VideoANT was designed using the three criteria covered in the section Existing Online Video Annotation Tools as a guide. Additional emphasis was placed on the third criterion with hopes of providing a system that users would find both pleasurable and easy to use. As noted by Norman (2004), “There is no excuse for user

Figure 1. A comparison of online annotation tools using three project requirements.