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Robert Neale

Yuan Zhang

Lloyd Thompson

Armen Mkrtchyan

Brian Mulford

See next page for additional authors

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Inventor(s)

Robert Neale, Yuan Zhang, Lloyd Thompson, Armen Mkrtchyan, Brian Mulford, and Murtaza Halai

Dynamic Media Unit Switching Between Different Media Types Based On Loading State And User Interaction

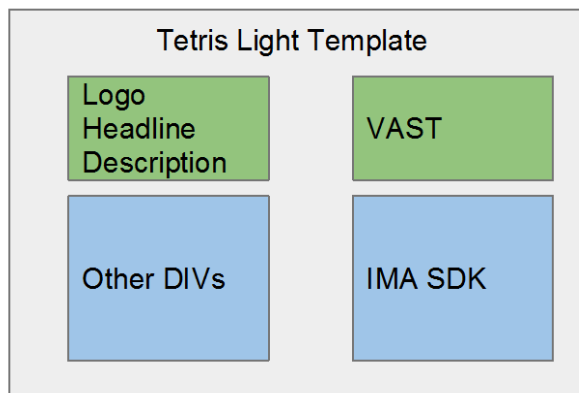
Many information resources, such as webpages, social media network pages, or mobile application pages, display video content within respective slots. For instance, an information resource may include a video player API, e.g., `HTMLVideoElement`, to initiate a respective video player for streaming and playing video content associated with that information resource on a client device. The information resource usually calls the video player API responsive to an interaction by the client device with the information resource or a corresponding slot. Automatic playback, or autoplay, allows this video content to automatically play when visible within a web browser window or application.

However, many web browsers and mobile applications do not automatically play video content associated with information resources; for example, autoplay of content may be blocked by the operating system or browser. Additionally, many web browsers and mobile applications retrieve and playback video content associated with information resources in a sub-optimal way, not taking into account client device capabilities (software and hardware), user expectations, or loading state of the media.

Autoplay of video content associated with an information resource, for example, during download of the information resource on a client device, may also lead to degraded user experience. Automatic playback of the video content upon downloading the information resource on the client device may result in abrupt or unexpected audio output, annoying the user. Also, upon failure to download the video content, the browser or the mobile application can keep requesting the content repetitively resulting in degraded user experience and additional bandwidth usage. Furthermore, autoplay of video content associated with information resources on a client device may increase

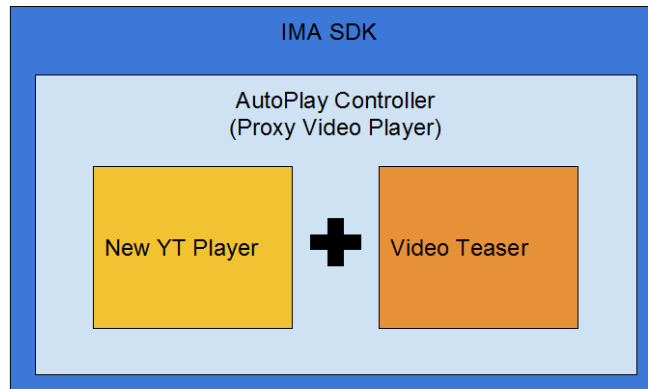
power consumption by the client device. For mobile devices in particular, increased power consumption may lead to fast drainage of the device battery.

To overcome the above described deficiencies, a data processing system can generate multimedia units for display with information resources on client devices that allow dynamic adjustment of media content, for example, based on client device capabilities, user's browsing behavior and actions, loading state of the media content, or a combination thereof. Each multimedia unit can include a thumbnail image, a first link to a first video sequence, a second link to a second video sequence, and a software module (e.g., controller) for controlling display of the image thumbnail and content associated with the first and second video sequences:



Example multimedia unit

The first video sequence can be a preview of the second video sequence. For example, if the second image sequence represents a video ad, the first video sequence may represent the first 30 seconds of the second video sequence. Multimedia units may thus include metadata, a Video Ad Serving Template (VAST) file, an Interactive Media Ad (IMA) SDK, or any other such data or content. The IMA SDK may include, in some implementations, a proxy video player to autoplay one or more media files:



Example IMA SDK

After the data processing system has delivered the multimedia unit to a client device, the controller can display the thumbnail image within a slot of the information resource for a first period of time (e.g., 4 or 5 seconds). The controller can detect user interaction (e.g., clicks, touch, cursor hovering, or the like) with the thumbnail image during the first period of time. The controller can also monitor the position of the slot with respect to the viewport of the information resource. If no interaction with the image thumbnail is detected during the first time period and the controller determines the slot to be within the viewport, in some implementations, the controller can stream video segments of the first video sequence and play video content, but not audio content, of the streamed video segments using a teaser module. As such, the playback of the first video sequence is mute with no audio output, avoiding user irritation. If the controller detects interaction with the image thumbnail during the first period of time, the controller can skip playback of the first video sequence and cause a player associated with the browser or mobile application to stream and playback video segments of the second video sequence. The player associated with the browser or mobile application can playback video and audio content of the second image sequence.

The user of the client device can interact with the first video sequence while being played within the slot. Upon detecting an interaction with the first video sequence while being played, the controller can terminate playback of the first video sequence, and start streaming and playback of video segments of the second video sequence. The controller can playback video and audio content of the second video sequence. However, if the controller plays back the whole first video sequence (e.g., teaser time period lapses) without detecting any user interaction, the controller can revert back to displaying the image thumbnail within the slot.

The multimedia unit allows for adaptation of presentation of respective multimedia content based on user interest. For instance, user interaction with the image thumbnail or the teaser playback of mute video content can be viewed as user interest in viewing the second video sequence. Also, the multimedia unit allows for improved user experience by providing media content of various types (e.g., image thumbnail and mute video sequence preview) without annoying the user. The controller may check if the client device or the respective browser or mobile application is capable of executing the teaser before initiating streaming of the first video sequence. If the client device is incapable of executing the teaser, the controller can skip playback of the video preview (or first video sequence). As such, the controller can avoid unnecessary attempts of streaming and/or playing of video segments of the first video sequence.

Thus, in some implementations, the present disclosure describes a system. The system includes a processor executing an image display utility, a first video player, a second video player, a timer, and a controller; and a network interface in communication with a content server. The network interface is configured to receive, from the content

server, a multimedia unit including a thumbnail image, a first address of a first video sequence, and a second address of a second video sequence. The image display utility is configured to display the thumbnail image until a first expiration of the timer, and the controller is configured to monitor a position of the thumbnail image with respect to a viewport of the image display utility; responsive to determining that the position is within the viewport upon the first expiration of the timer, direct the first video player to retrieve and display the first video sequence at the position; and detect an interaction with the first video player prior to a second expiration of the timer. The image display utility is also configured to, responsive to detecting the interaction prior to the second expiration of the timer, direct the second video player to retrieve and display the second video sequence at the position.

Abstract

A data processing system can generate multimedia units for display with information resources on client devices that allow dynamic adjustment of media content, for example, based on client device capabilities, user's browsing behavior and actions, loading state of the media content, or a combination thereof. Each multimedia unit can include a thumbnail image, a first link to a first video sequence, a second link to a second video sequence, and a software module (e.g., controller) for controlling display of the image thumbnail and content associated with the first and second video sequences.