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SMART EMOTIONAL FEEDBACK COLLECTION

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A content item service may allow users to upload media items (e.g., videos, audio, livestreams, etc.) on the content item service. Such media items may be streamed or otherwise provided or rendered to various users. The media item may be rendered on different types of devices and platforms, such as, on desktop computers, laptops, phones, televisions, gaming consoles, different web browsers and operating systems, etc. The users may provide feedback on the media item in a number of ways. For example, a user may select a predefined button, such as "like," "dislike," "favorite," etc., to indicate the user's feedback associated with the content item. In another example, a user may provide a comment (e.g., text, image, emoji, etc.) on a media item. A user may indicate a specific point in the media item, or a segment within the media item to which the user's provided comment relates to. The user may provide the feedback while consuming the media item or after finishing the consumption of the media item. A user may also provide feedback to media items by creating the user's own video responses.

A user may experience various types of emotions while consuming a media item. The user may experience varying emotions to the same media item at different times. For example, while watching a movie, a user may experience a joyful emotion during one segment of the movie, whereas the user may experience anger during another segment of the movie, and sorrow during yet another segment. At times, the emotions experienced may change rapidly. When using traditional methods, various challenges exist in terms of providing feedback on media items. For example, predefined buttons may be associated with an entire media item instead of specific portions of the media item. Thus a single predefined button may not capture the different emotions experienced by the user or particularly identify the specific portion of the media to which the feedback is associated with. In another example, while the user is engaged in

consuming a media item, it may be too cumbersome and/or time consuming to provide a comment on the media item, as the user has to type out the comment, which may lead to taking attention away from the actual media content. The intensity of the emotion may be lost by the time a user has thought of the appropriate keyword and found the right keys on a keyboard to be able to type in the keyword. Typing while consuming the media may not be a convenient option, especially depending on the type of device being used. For example, typing while watching a video on a TV monitor or a gaming console may pose challenges due to inconvenient input devices that are available for typing. The user may not associate comments to a particular point or a segment of the media item due to various reasons, such as lack of time, the extra effort to identify and provide the timestamp, etc. Creating video responses may require investing rather significant time and effort on the user's part and thus users may not pursue video responses as they are experiencing a certain emotion. Additionally, comments and predefined buttons may be associated with a user's profile and the user may not feel comfortable to express their emotions publicly.

A mechanism is proposed for providing smart emotional feedback associated with media items such that minimal effort and interruptions are experienced and feedback is provided on a granular level of the media item. The mechanism can blend seamlessly with the media consumption experience. For example, a content item service may identify a set of features associated with a segment (e.g., 10 seconds) of a video. The content item service may also identify a first set of comments that were provided by a number of users where the users identified particular points within the video included in the segment of the video. In addition, the content item service may identify a second set of comments associated with other video items that include the set of features identified by the content item service. The content item service

may analyze the segment of the video, the set of features associated with the video, and the first and second set of comments. The content item service may identify a set of potential feedback that is likely to be elicited by users viewing the segment of the video, where the identification may be based on the set of features, the first set of comments and the second set of comments. The content item service may display one or more feedback from the set of potential feedback to a user while the user is viewing the segment of the videos. In some instances, the one or more feedback may be selected based on factors associated with the user, such as, comments previously provided by the user, the style of comments used by the user, the user's profile, history of media consumption, etc. The user may or may not select a feedback from the one or more displayed feedback while watching the video. If the user selects a feedback, the content item service may receive the selection of the feedback. Upon receiving the feedback, the user may store the response selected by the user. In some instances, the stored feedback may be used for further action taken by the content item service to improve the feedback collection mechanism, video recommendations, or other functions of the content item service. In some instances, no action may be taken and the feedback may be collected for giving users an opportunity to express their emotions and providing users satisfying user experience.

Figure 1 depicts a flow diagram of a method for smart feedback collection. First, at step 101, a content item service may identify a set of features associated with a segment of a video. Videos may be indexed over time with features that are suggestive of good moments for providing feedback, and predict the kind of feedback that may be likely. The predictions may also be made based on content analysis by pre-processing media items available within the content service.

Subsequently, at step 102, content item service may identify a first set of comments associated with the segment of the video. Users may have provided comments on a media item, using words, images, emojis, etc. In some instances, users may identify and/or link the particular segment of the media item to the comments. For example, a user may submit a comment: "I was sad when the baby fell down at 3:24." Another user may provide a contrasting comment: "It was too funny watching the baby fall, watch starting at 3:18." In some examples, the content item service may identify comments that have not been associated with a particular segment of a video, however, are associated with the video in general. In some instances, the content item service may be able to analyze the general comments and associate the comments to particular segments of the media item based on various factors, such as, context, time entered, etc.

Next, at step 103, content item service may identify a second set of comments associated with the set of features. The content item service may take the set of features associated with the segment of the video and identify additional videos and video segments having the same features across the entire content item service. The content item service may identify comments associated with the additional videos as the second set of comments.

Subsequently, at step 104, content item service may identify a set of potential feedback associated with the segment of the video based on the set of features, the first set of comments and the second set of comments. Potential feedback may be identified by predicting responses that the segment in the video might cause in the user. The prediction may be based on the set of features, the first set of comments and the second set of comments. Additionally, the prediction may also be based on response videos related to the video. External sources may also be used to predict the potential feedback. For example, comments, feedback, discussion, etc. associated with the content of the video on other websites, applications, messaging interfaces, etc. may be

used to obtain additional feedback to be included in the set of potential feedback. Machine learning models may be used to train the system to predict potential feedback. In addition, text sequence generation techniques may be used to learn from the set of potential feedback and generate new feedback, or a combination of text to generate additional feedback. Multiple words from the set of potential feedback may be used to generate meaningful sentences which can express appropriate emotions for the video segment. Filtering techniques can be employed to automatically filter out certain feedback from the set of potential feedback. For example content item service may choose to filter out foul languages, controversial, embarrassing, hateful, harassing, or contextually inappropriate responses from the set of potential feedback..

Next, at step 105, content item service may display one or more of the set of potential feedback to a user while the user is viewing the segment of the video. For example, a small number (e.g., 2, 5, etc.) of appropriate feedback (e.g., responses, comments, emoji, etc.) options may be displayed to a user when the user is viewing the segment of the video. The displayed feedback options may be selected from the set of potential feedback. The feedback options that are displayed to the user may be selected based on weights, priorities, relevancy, or other types of scores associated with each of the feedback. The feedback may vary based on the media item, user, context, segment, etc. In some instances, the feedback may be customized for the user. For example, if the user makes frequent comments, the content item service may be able to use the previous comments (whether on the current media item or other items) to generate language of the feedback that is personalized for the user. Language may be further personalized based on the user's customized styles obtained from other applications (e.g., email, document hosting, social media, messenger, etc.) used by the user that are associated with the user's account on the content item service. In another example, the user may be more prone to provide a certain type of

a comment or feedback for a certain type of a video content and using the user's previous comments and feedback, the content item service may be able to predict the likely feedback from the user more accurately. The one or more of the feedback may be provided for every video segment of the video that has an identified set of potential feedback associated. However, in some instances, the content item service may not display the feedback for each segment. Instead video segments may be prioritized and feedback options may be offered for certain segments having a priority level over a defined threshold. In some instances, the content item service may not have identified any feedback to include in the set of potential feedback for the segment the user is viewing. In that case, the content item service may not display any feedback option to the user.

In an example, the content item service may display two feedback options for a segment of a video as a user views the segment. The options may be placed at a location that does not interfere with a major feature of the media item, or interfere with the user's viewing experience. The options may remain visible for a short period of time (e.g., 5 seconds, 10 second, etc.) and slowly start to disappear if the user does not select one of the options. If the user selects one of the feedback options, the feedback options may disappear immediately. The feedback mechanism provided to the user would have to take into consideration mobile and TV visible player and input restrictions, and offer appropriate and convenient selection options. In some cases, voice feedback may be requested as a feedback option. In some instances, in addition or alternative to providing one or more feedback option, a user may be given the option to quickly provide a customized response that the user controls. For example, a virtual keyboard may be displayed for the user which may provide shortcuts to words and emojis, enable swipe actions for typing, autocomplete suggestions as user starts typing based on context, etc.

Subsequently, at step 106, content item service may receive, from the user, a selection of a feedback selected from the one or more displayed feedback. As the feedback options are displayed to the user, the user may select one of the feedback options. The content item service may receive the selection from the user. The content item may also receive a voice feedback as audio, a customized feedback that the user has provided using a keyboard, etc. In some examples, the selection may be received at a given time. The feedback may be associated with the video for that given time. Alternatively, because the system provides the feedback options to the user based on a particular segment, even if the selection was received at a given time that is different from the particular segment of the video, the content item service may associate the feedback to the particular segment of the video instead of the given time when the feedback is received. Thus, the system is intelligent to differentiate between received time of feedback and actual time in the video for which the feedback has been submitted.

Next, at step 107, content item service may store the feedback selected by the user. Feedback may be stored and indexed by point in time or time range within the content. The stored feedback may or may not be used to take further actions. For example, in some instances, no action may be taken and the feedback may be collected for the purposes of giving the users an opportunity to express their emotions and providing the user a satisfying user experience. In some instances, the feedback may be used for further action taken by the content item service to improve the feedback collection model, video recommendations, or other functions of the content item service. The information may be used to recommend videos to viewers who have not seen them, or recommend re-watching the content to the same users, recommend videos with

similar feedback frequently generated by the user, assess the quality of the content, assess effectiveness of content, etc. The stored feedback may be used to improve future experience of the user from whom the feedback was collected. In some instances, the stored feedback may also be used to improve user experience of other users. In some examples, videos may be categorized by types of feedback that the videos most frequently generate. A user may be able to start a session by choosing a "mood" that the user is in or a category of videos that the user is interested in viewing, and the categorization of the videos based on the feedback may be used to provide a list of videos that satisfy the user's "mood" or category preferences.

In some examples, the stored feedback may be listed as a history of feedback provided by the user on videos or other media items. The user may be able to revisit the feedback at a later time. In some examples, the collected feedback may be used to improve the feedback offering and collection mechanism. Surveys may be conducted to understand the user's needs for providing appropriate emotional responses as well as user's need for overall experience of media hosted by the content item service have been met by the feedback mechanism and the media items in general. The data may be used as further input to machine learning models for prediction of appropriate potential feedback for media items. In some examples, content creators and advertiser may use the stored feedback data to understand audience responses and how to improve quality of their content and meet their needs. When using the stored feedback data, the system may take into consideration intensely biased missing data, including users that never respond, users that do not respond because the emotion they are feeling was not offered as a choice, and users that do not understand the meaning of the interface or that intentionally enter bad data.

The mechanism described herein allows for providing intelligent options for feedback associated with media items such that minimal effort and interruptions are experienced. The mechanism allows for providing feedback at a granular level tied to segments of the media item rather than on a generic, media item level. The mechanism can blend seamlessly with the media consumption experience without disruptions. The mechanism provides for a more versatile and customized feedback than a set of predefined feedback that may not express the user's true emotions. The mechanism allows providing feedback fast and without wasting time of the user. It allows for feedback to be provided from various devices and input mechanisms. It can allow for feedback to be submitted anonymously.

ABSTRACT

A mechanism is proposed for providing smart emotion feedback associated with media items such that minimal effort and interruptions are experienced and feedback is provided on a granular level of the media item. A content item service may identify a set of features associated with a segment, may identify a first set of comments associated with the segment of the video, and may identify a second set of comments associated with the set of features. A set of potential feedback associated with the segment of a video may be identified based on the set of features, the first set of comments and the second set of comments. The content item service may display one or more of the set of potential feedback to a user while the user is viewing the segment of the video. The content item service may receive, from the user, a selection of a feedback selected from the one or more displayed feedback and store the feedback selected by the user.

Keywords: video, media, emotion, response, comments, feedback, machine learning.
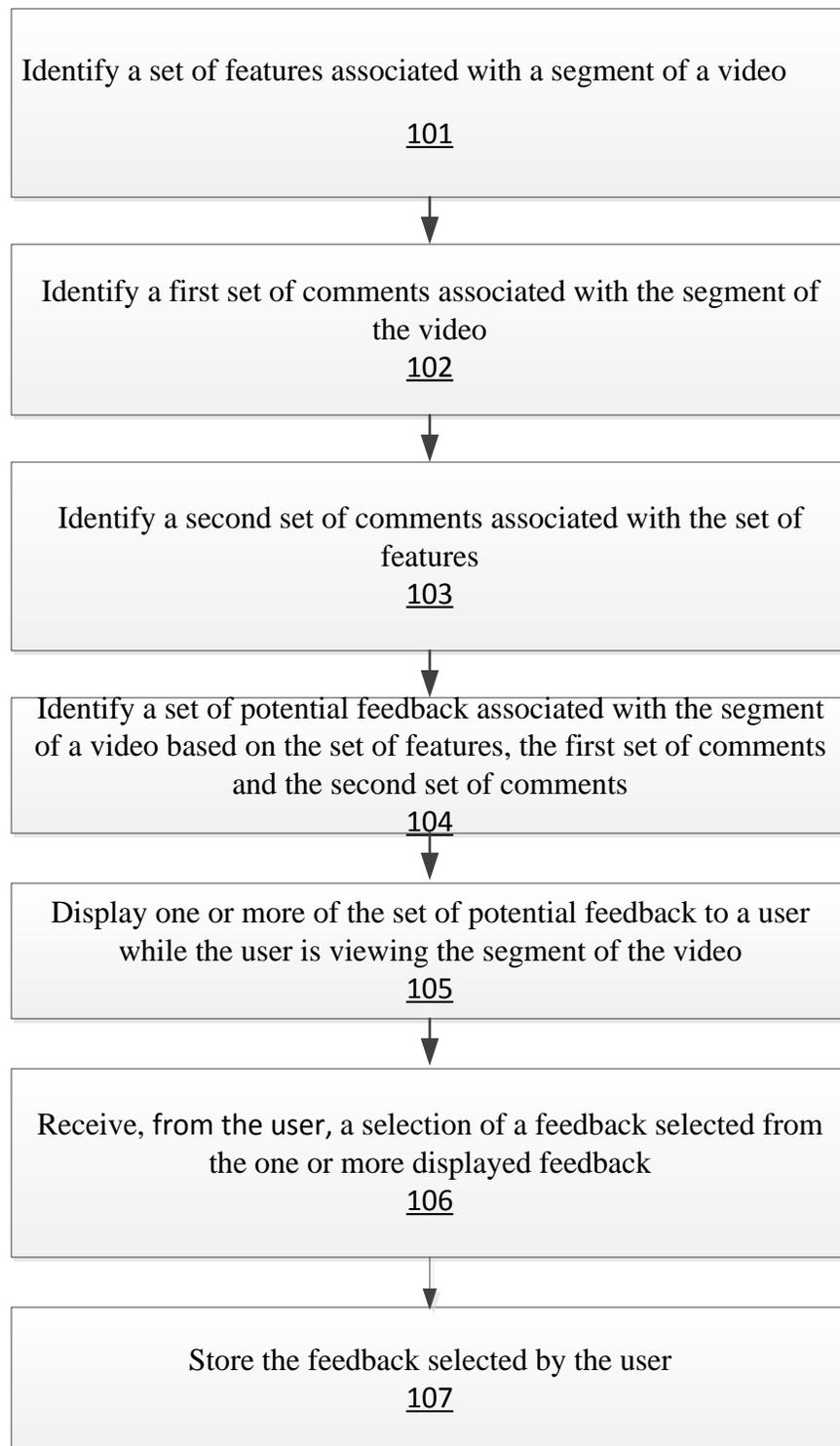
Identify a set of features associated with a segment of a video

101

Identify a first set of comments associated with the segment of the video

102

Identify a second set of comments associated with the set of features

103

Identify a set of potential feedback associated with the segment of a video based on the set of features, the first set of comments and the second set of comments

104

Display one or more of the set of potential feedback to a user while the user is viewing the segment of the video

105

Receive, from the user, a selection of a feedback selected from the one or more displayed feedback

106

Store the feedback selected by the user

107

FIG. 1