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## **DETERMINING AFFINITY SCORES FOR LIVE VIDEO CONTENT**

### ABSTRACT

Disclosed herein is a mechanism for determining affinity scores for live video content. The mechanism can include identifying a live video stream and a target user. The mechanism can then determine viewership scores for users similar to the target user based on a number of users viewing the live video stream. The mechanism can update the viewership scores over time to determine whether the number of users is increasing or decreasing and whether users prefer to watch the video content when it is live or after it has already aired. The mechanism can determine an affinity of the target user for live video content. The mechanism can then calculate an affinity score of the target user for the live video stream based on the viewership score of other users and based on the affinity of the target user for watching live video content. The mechanism can update the affinity score of the target user for the video content over time as portions of the video stream air and are no longer live.

### BACKGROUND

Users often want to watch live video content, such as sporting events or news events, streamed on user devices. Additionally, users may appreciate video content recommendations, whether for live video content or video on demand content. However, it can be difficult to determine an affinity score for live video content that indicates a likelihood that a particular user is interested in watching the live video content. Furthermore, it can be difficult to adjust the affinity score for the live video content once the content is no longer live. For example, a user may be interested in viewing coverage of a news event while it is happening as a live video stream, but may be less interested in viewing the coverage of the event after it has occurred as a

video-on-demand video item. Thus, there is a need for a better approach to determine affinity scores for live video content.

DESCRIPTION

The systems and techniques described in this disclosure relate to determining affinity scores for live video content and adjusting the affinity scores as a live stream becomes video on demand. The system can be implemented on a server device. FIG. 1 shows an illustrative example of a process for determining and adjusting affinity scores for live video content.

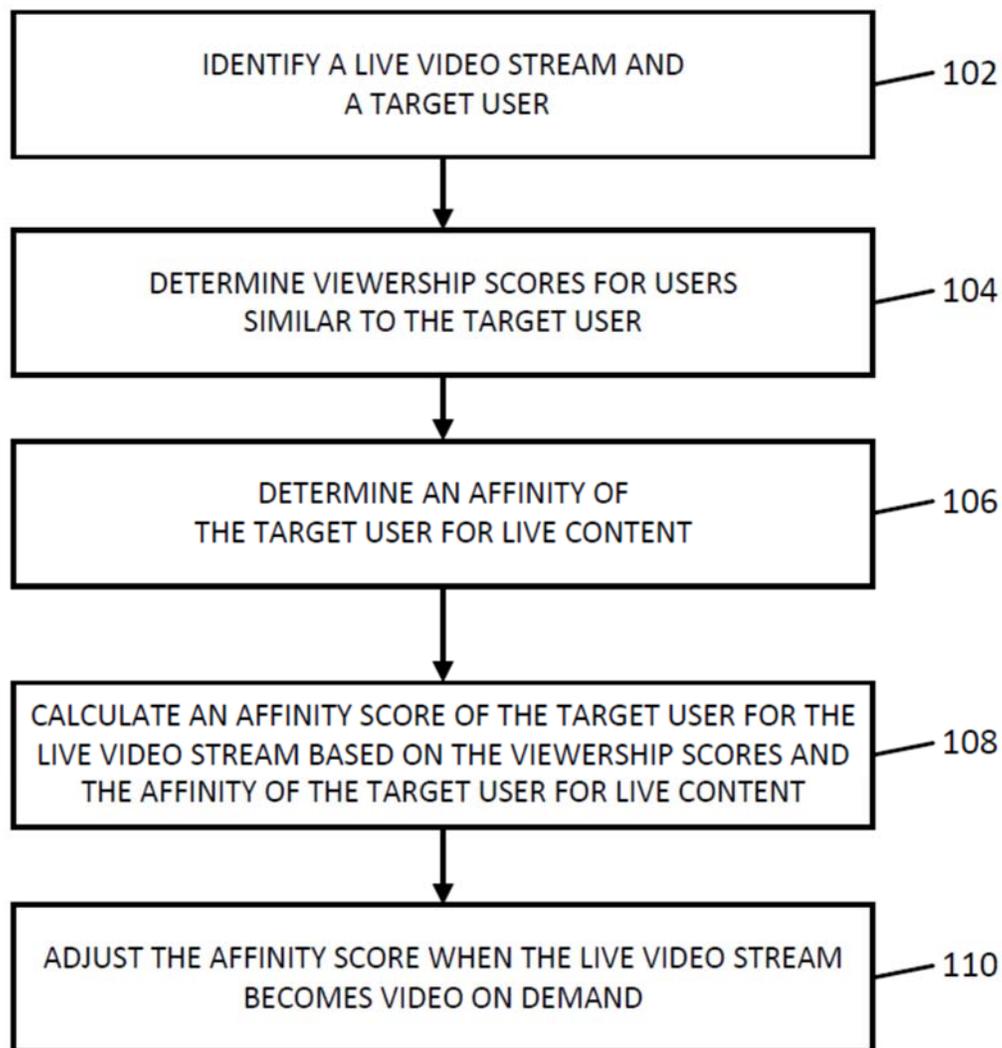


FIG. 1

Turning to FIG. 1, at step 102, the system can identify a live video stream and a target user. The live video stream can be identified based on any suitable information. For example, the system can identify all new live video streams that have been initiated on a particular video sharing service. As another example, the system can identify live video streams that are being streamed by a particular entity (e.g., a particular content creator, a particular broadcast channel, and/or any other suitable entity). The system can identify the target user based on any suitable information. For example, the target user can be identified based on users who have accounts with a particular video sharing service.

At step 104, the system can determine viewership scores for the live video stream for users who are similar to the target user in any suitable manner. For example, the system can identify a group of users who have similar interests to the target user, a group of users who have previously watched content similar to content the target user has previously watched, a group of users who have subscribed to the same channels as the target user, a group of users with similar demographic characteristics as the target user, and/or based on any other suitable information.

It should be noted that the system can determine the viewership scores for the live video stream using any suitable technique or combination of techniques. For example, the system can determine a number of users out of the group of users similar to the target user who have watched the live video stream. As another example, the system can determine an average watch time of the live video stream by users in the group of users similar to the target user. As yet another example, the system can determine a click-through rate that indicates a proportion of viewers that have selected the live video stream from a recommendation of the live video stream. In instances where the system calculates viewership scores based on multiple factors (e.g., a total number of users who have watched the live video stream, an average watch time, and/or any

other suitable factors), the system can create a composite viewership score for the live video stream by combining the viewership score based on each factor in any suitable manner. Note also that, in some instances, the system can determine a non-live viewership score for portions of the live video stream that have already aired, which can be calculated and stored separately from a viewership score for live portions of the video stream.

The system can update the viewership score(s) during the live stream and/or calculate multiple viewership score(s) for different time points of the live stream. For example, in an instance where more viewers begin viewing a live video stream as it is presented, the viewership scores can indicate an upward trend in a number of viewers viewing the live video stream during presentation. As another example, in an instance where viewers stop viewing the live video stream, the viewership scores can indicate a downward trend in a number of viewers of the live video stream during presentation.

At step 106, the system can determine an affinity of the target user for live video content. The affinity of the target user for live video content can be determined based on any suitable information. For example, the affinity for live video content can be determined based on whether, in a current video viewing session, the target user has visited a page associated with live video content (e.g., a page from a video sharing service indicating currently available live video streams, and/or any other suitable page). As another example, the affinity for live video content can be determined based on a number of times the target user has previously viewed live video content (e.g., a total number of times, a number of times in the past week, a number of times in the past month, a number of times at a particular time of day, etc.).

At step 108, the system can calculate an affinity score of the target user for the live video stream. The system can calculate the affinity score of the target user for the live video stream

based on the viewership scores associated with the live video stream as described above in connection with step 104 and the affinity of the target user for viewing live video content as described above in connection with step 106. The system can combine the viewership scores and the affinity of the target user for viewing live video content in any suitable manner. For example, the system can assign a higher weight to the affinity of the target user for viewing live video content during a current video viewing session relative to a weight for the viewership score(s) for the live video stream. As another example, in an instance where the viewership scores for the live video stream indicate an increasing trend in viewership over the duration of the live video stream, the system can assign a higher weight to the viewership scores relative to a weight for the affinity of the target user for viewing live video content.

At step 110, the system can adjust the affinity score for the live video stream as it is aired and is no longer live, that is, as the live video stream becomes video on demand. For example, the system can adjust the affinity score for the live video stream based on updated viewership score(s) over the course of presentation of the live video stream. As a more particular example, in instances where the viewership score(s) indicate an upward trend in a number of viewers of the live video stream, the system can increase the affinity score for the live video stream. As another example, in instances where an affinity of the target user for live video content indicates that the target user tends to fast-forward through content (e.g., all content, content of a particular type such as commercials, and/or through any other suitable type of content), the system can determine that the affinity score for the video stream is to be low while the content is live and increase as the video stream is no longer live, thereby allowing the user to fast-forward through content. As a more particular example, the system can apply a step function to the affinity score to indicate that the affinity is to increase when the video stream is no longer live. In some

instances, the system can adjust the affinity score for the live video stream as it becomes video on demand by determining viewership scores for the video once it becomes video on demand and/or for portions of the video stream that have already aired and calculating the affinity score as a value between the affinity score for the live portion of the video stream and the affinity score for the non-live portion of the video stream. In some such instances, the system can continually update the affinity score as the live stream airs based on updated viewership scores for both the live portion of the stream and the non-live portions of the video stream (e.g., portions that have already aired).

Note that, although the techniques described herein are described as determining and adjusting affinity scores of a user for live video content, the techniques and systems described herein can be used to determine and adjust affinity scores for any other suitable types of content. For example, the system can determine and adjust affinity scores for media content over time. As a more particular example, the system can determine an affinity score of a target user for a media content item when it is first created or broadcast and can adjust the affinity score of the target user for the media content item over time based on any suitable information, such as viewership scores for the media content item over time, an affinity of the target user for viewing new content, and/or based on any other suitable information. As another example, the system can determine affinity scores of a target user for viewing media content in a background mode. As yet another example, the system can determine affinity scores of a target user for viewing video content items as audio-only content.

Accordingly, a mechanism for determining affinity scores for live video content is provided.