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# CLIENT-SIDE SESSION-BASED CONTEXTUAL USER MODEL BUILDER

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## CLIENT-SIDE SESSION-BASED CONTEXTUAL USER MODEL BUILDER

### TECHNICAL FIELD

This disclosure generally relates to user models and the selection of content.

### BACKGROUND

Contextual user models that are based on user activity sessions at a client side can provide challenges to preserving privacy for the user. However, user models can improve the quality of personalization of content (including advertisements) provided to users. When use of a user identifier is not available or is not permitted, it can be difficult to maintain a state of a user and provide information to a server side in an anonymous way.

### SUMMARY

In general, a technique is provided to produce contextual profiles based on one or more videos for use in content selection. The technique extends existing techniques for using information about sessions of user activities. The technique can be used to improve the quality of personalization of videos from video sharing and distribution sites as well as providing improved personalization of content. Third parties can incorporate the technique into their client-side software or devices in order to improve personalization of their services.

### DESCRIPTION OF DRAWINGS

FIG. 1 is an example environment in which a client-side user model is created and maintained for use in selecting content.

DETAILED DESCRIPTION

FIG. 1 is an example environment 100 in which a client-side user model is created and maintained for use in selecting content. For example, a client device 102, such as a user's mobile or non-mobile computer device, can include a user model builder 104 that creates and updates a client-side user model 106. Creating and updating the client-side user model 106 can be based on information obtained from sessions of video watch history of a user using the client device 102. The client-side user model 106 can contain contextually-derived demographics and interests, e.g., that are determined or inferred from the video watch history of the user. The client device 102 can send information from the client-side user model 106 to a server 108 to improve personalization of content that the server 108 provides to the client device 102.

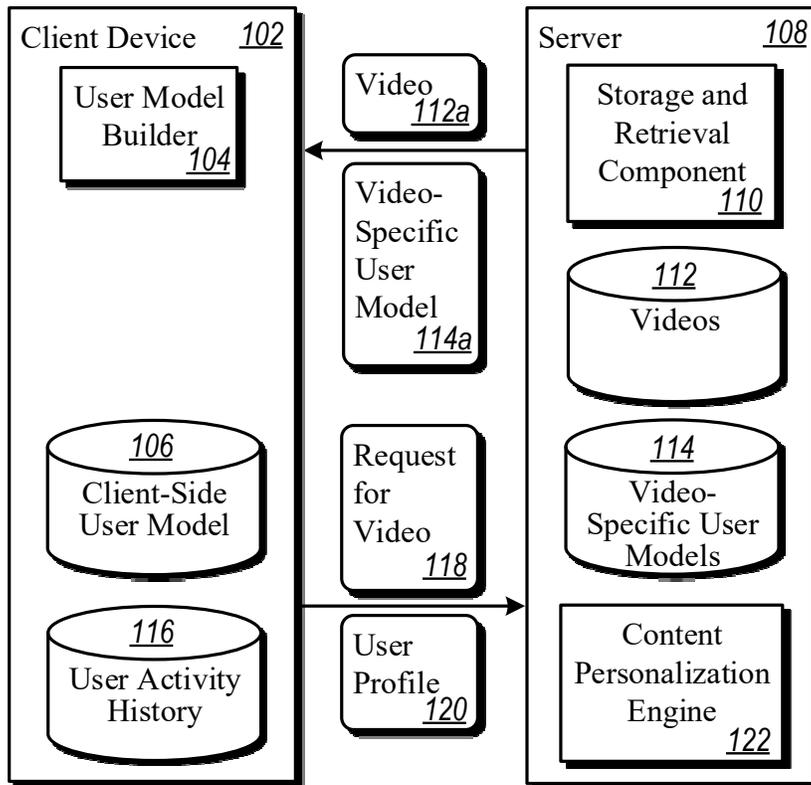


FIG. 1

The server 108 includes a storage and retrieval component 110 that stores and retrieves videos 112. The storage and retrieval component 110 also maintains video-specific user models 114 that contain contextual information for individual videos 112. When a video 112a is delivered to the client device 102, for example, a video-specific user model 114a is sent to the client device 102 along with the video 112a. Both the video 112a and the video-specific user model 114a can be in encrypted form.

When the video 112a and the video-specific user model 114 are received at the client device 102, the user model builder 104 can use information from the video-specific user model 114 to update the client-side user model 106. Further, the user model builder 104 can maintain a user activity history 116 that includes user activity information regarding the selection and watching of videos. The user model builder 104 can use information from the user activity history 116 to update the client-side user model 106, such as in an auto-regressive manner. The user activity history 116 can include a time decay feature, for example, to provide a greater weight or emphasis to recent user activity compared with older user activity.

When the client device 102 provides a video request 118 to the server 108 for another video 112 (e.g., the next video to be watched by the user), the client device 102 can also send a user profile 120. The user profile 120 can include information derived from the client-side user model 106, including information about user attributes, such as demographics, interest categories, and other profile information.

In response to the received video request 118, the server 108 can provide a requested video 112. A content personalization engine 122 at the server 108 can use information from the user profile 120 to select and personalize content that is to be provided to the client device 102.

An advantage of this approach is that the server 108 does not require a user identifier and does not need to maintain a user history, which helps to protect user privacy. Another advantage is that operation on the server side is stateless, as user information is maintained only on the client side. Another advantage is that users have complete control to disable, pause, or delete their own profile at any time. In some implementations, the approach can be extended to incorporate other user activity data, such as webpage visits.

## ABSTRACT OF THE DISCLOSURE

A client-side user model is created and maintained for use in selecting content. For example, a user model builder creates and updates a client-side user model. The client-side user model is populated with information from a video-specific user model received from a server and updated at the client side using information from a user activity history, including a video watching history. When requesting a video from the server, the client device can send a user profile derived from the client-side user model. The server can use information from the user profile to personalize content provided to the client device.