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Real-time augmented reality filters expressive of user sentiment

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ABSTRACT

Body language and facial expressions are an important component of human communication. Some messaging applications include features to send emoji, animated GIFs, etc. to express emotion. However, such content does not include the user's image. This disclosure describes techniques that enable users to choose augmented reality effects that are added to a user's image and that help users express an emotion.

KEYWORDS

- augmented reality
- image overlay
- selfie
- emoji
- emotion expression
- facial expression
- body language
- messaging app

BACKGROUND

Body language and facial expressions are an important component of human communication. For example, the phrase "oh really" means different things when the speaker's face is expressionless than when an eyebrow of the speaker is raised. Some messaging applications include features to send emoji, animated GIFs, etc. to express emotion. However, such content does not include the user's image or expression. While using a messaging application, users have difficulty finding the right facial expressions and movements

corresponding to their emotions, a problem that is exacerbated as communications move from text to photos and videos.

DESCRIPTION

This disclosure describes techniques that enable users to choose augmented reality (AR) effects to be applied to a user's image (e.g., a selfie image). The effects help users express an exaggerated emotion. The effects can include, e.g., 2D overlays, 3D overlays, area transformations, feature morphing, gif or animated overlays, blurring, effects on brightness and contrast, etc. Further, if the user permits access to an ongoing conversation, the conversation is analyzed using a machine learning model that predicts a suitable response. Corresponding AR filters are then surfaced allowing the user to easily select the desired effect.

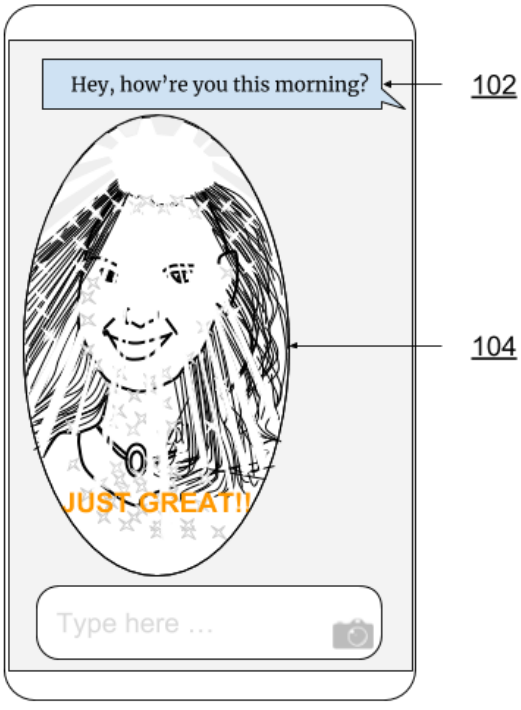

Fig. 1: Automatic surfacing of an AR filter based on conversational context

Fig. 1 illustrates an example of an automatically surfaced AR filter based on conversational context in a messaging application. When a user who has provided permission to

automatically analyze conversations and suggest AR filters receives a question, “how are you doing today morning?” (102) during a messaging conversation, a machine learning model analyzes the conversation and predicts that a likely user response is “just great.” If the user permits access to the device camera (or other source of image), an image, e.g., a live image of the user captured with the camera is obtained. An AR filter that expresses the sentiment of the response, e.g., one that has the sun rise from behind the user (104), is selected and the image is augmented, e.g., causing sparkles across the image of the user’s face. If the user approves, the augmented image is sent to other parties in the conversation. Other examples of filters that express a similar sentiment include, e.g., a thumbs-up sign that appears below the user’s chin in the foreground, etc.

To overlay or manipulate an image in real time, the techniques apply machine vision techniques such as face detection, to locate a face within a frame; face landmark tracking, to track points corresponding to different parts of the face; background segmentation, to separate the head or body from the background; etc. The described filters apply overlays or image manipulations that are designed to convey a particular meaning or emotion. The filters can be utilized within a messaging or chat application, or can also be made available in other contexts.

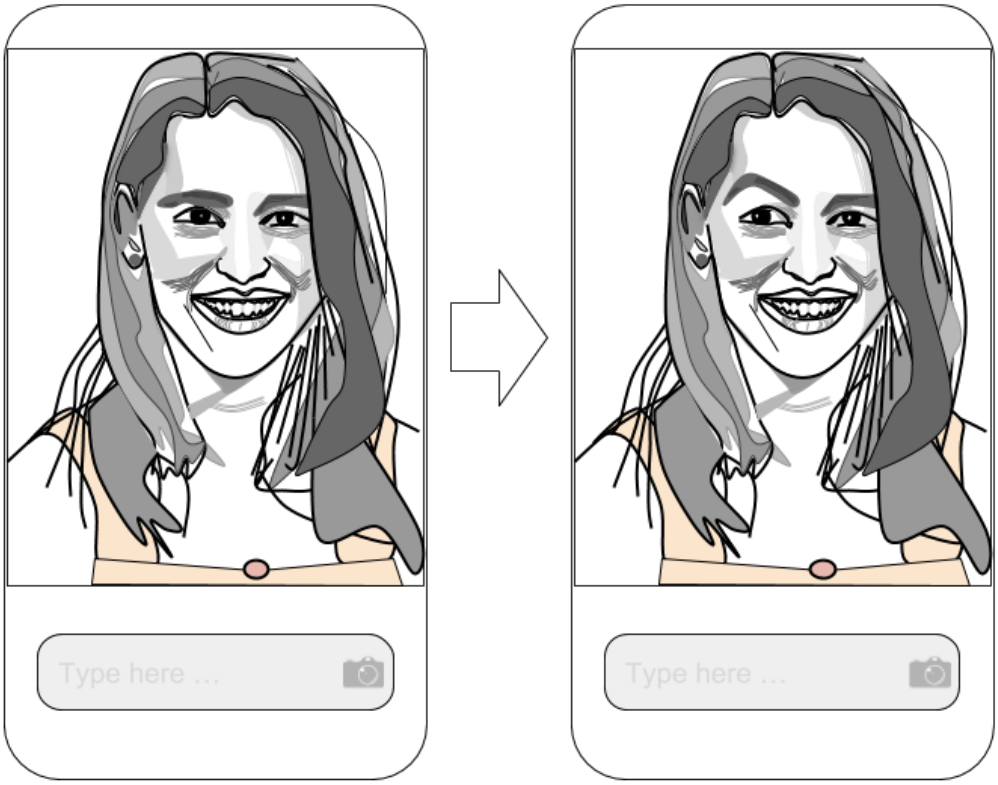

Fig. 2: An image manipulation to raise an eyebrow of the user

For example, Fig. 2 illustrates an image manipulation in which the augmentation includes modifying face pixels corresponding to an eyebrow e.g., to provide an exaggerated raised eyebrow image, that conveys, e.g., the sentiment in the phrase “oh really”. For example, to achieve such an effect, pixels corresponding to face landmarks from the middle of the left eyebrow can be moved up by a certain distance. The user is provided with the option to send the augmented image, choose a different filter, to send an unmodified image, or to respond to the incoming message in other ways. Images are modified by applying the AR filers upon specific user permission, and such images are sent to other participants in the conversation only in response to a user command.

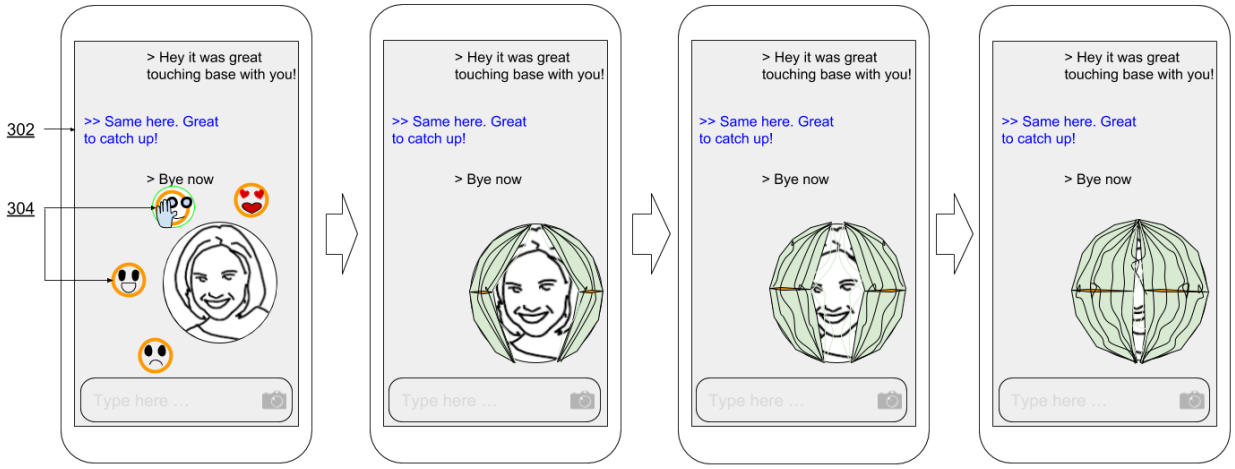

Fig. 3: Image overlay to convey contextual emotion

Fig. 3 illustrates an example of image overlay to convey contextual emotion, per techniques of this disclosure. Upon detecting the end of a conversation (302), the messaging model surfaces a number of relevant filters (304), e.g., filters that convey love, exit from conversation, happiness, sadness, etc. Upon the user selecting a filter that conveys exit, an image of the user is overlaid with a closing curtain. Upon approval of the user, such an augmented reality video of the user, e.g., with the user's face being gradually covered by a closing curtain, is sent to the other parties to the conversation.

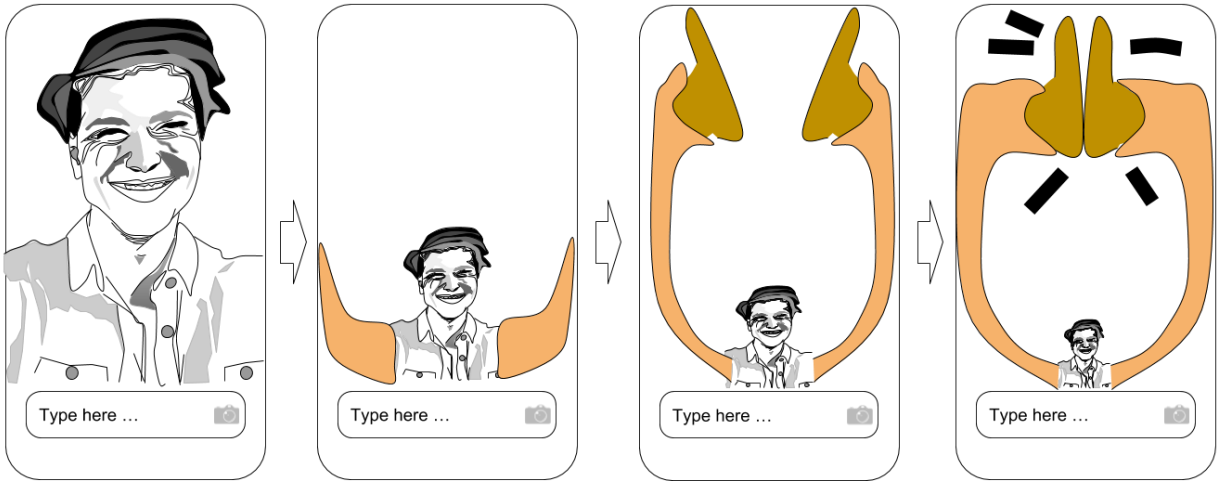

Fig. 4: A personalized augmented reality filter to express the sentiment of the phrase "thank you"

In a similar manner, Fig. 4 illustrates a personalized augmented reality filter to express the sentiment of the phrase “thank you.”

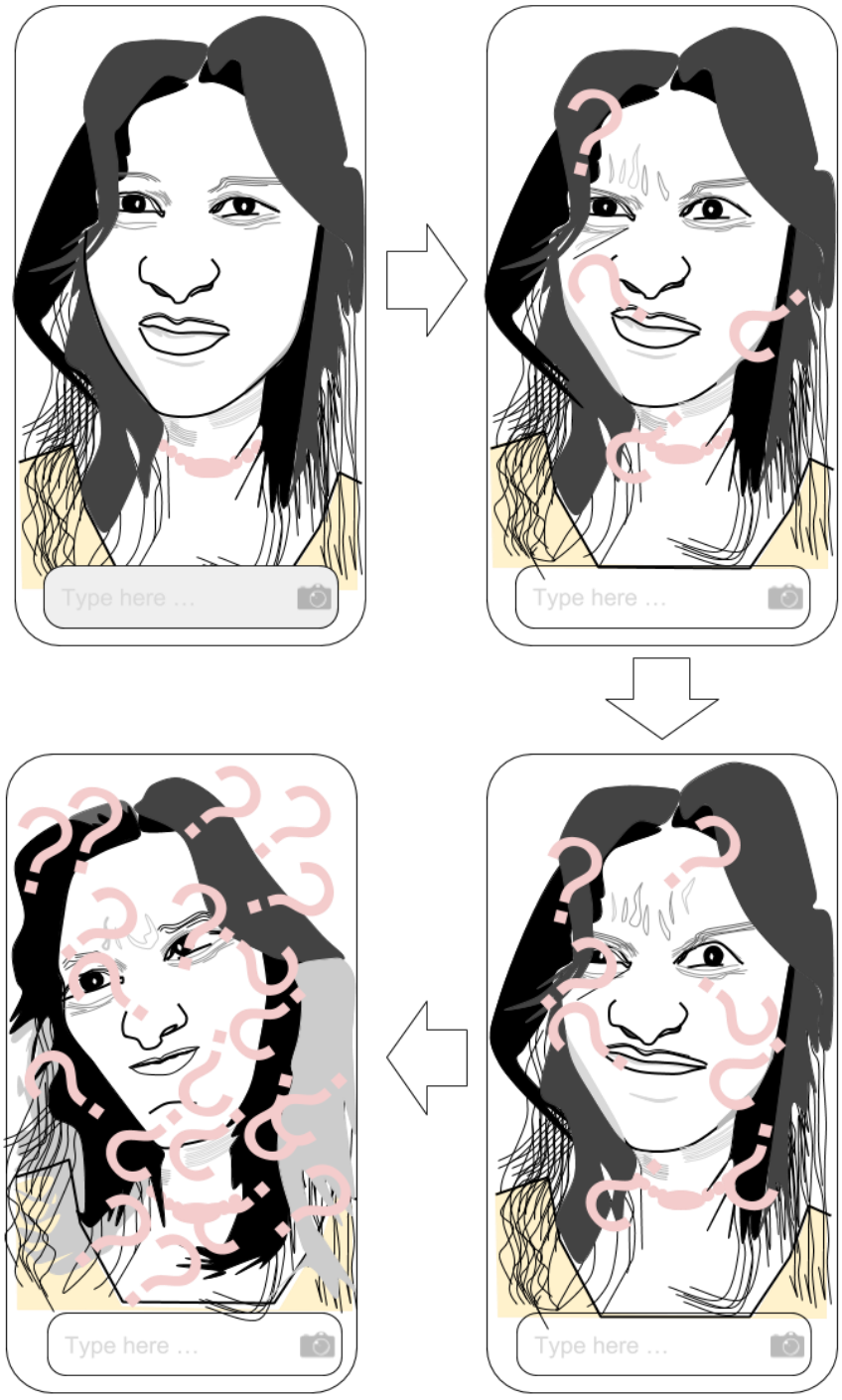

Fig. 5: A personalized augmented reality filter to express puzzlement or disappointment

Fig. 5 illustrates another example of the use of an AR filter to express an emotion, in this case, one of puzzlement or disappointment.

In this manner, with user permission, the techniques of this disclosure use machine learning models to determine a suitable response in a conversation, and provide suggestions to send particular types of augmented images, generated using a library of AR filters. The filters are designed to convey topical, specific, and personalized emotions using real-time edits or overlays of a user's image or selfie. The AR filters are accessible and searchable within a conversation or messaging application, and are surfaced automatically to correspond to the context of the conversation.

Further to the descriptions above, a user may be provided with controls allowing the user to make an election as to both if and when systems, programs or features described herein may enable collection of user information (e.g., information about a user's social network, social actions or activities, profession, a user's preferences, or a user's current location), and if the user is sent content or communications from a server. In addition, certain data may be treated in one or more ways before it is stored or used, so that personally identifiable information is removed. For example, a user's identity may be treated so that no personally identifiable information can be determined for the user, or a user's geographic location may be generalized where location information is obtained (such as to a city, ZIP code, or state level), so that a particular location of a user cannot be determined. Thus, the user may have control over what information is collected about the user, how that information is used, and what information is provided to the user.

CONCLUSION

This disclosure describes techniques that enable users to choose augmented reality effects that are added to a user's image and that help users express an emotion.

REFERENCES

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