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Direct Actions

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DIRECT ACTIONS

ABSTRACT

Systems and methods described herein allow for monetization of a virtual personal assistant by offering sponsored content to users responsive to input audio signals triggering online actions. A data processing system can identify a user request based on a received input audio signal. The data processing system can execute an online action responsive to the identified user request. The data processing system can generate a response to the input audio signal based on the executed online action, and select a sponsored content item based on a context of the identified user request. The data processing system can then transmit the generated response and/or the selected sponsored content item for presentation to the user. The user may respond with an instruction for selecting or confirming a service described in the generated response or the sponsored content item, and the data processing system can inform the respective service provider of such confirmation.

DETAILED DESCRIPTION

In a voice-based interaction computer environment, users can engage in audio conversations with respective client devices. For instance, a client device implementing a front-end module of a virtual personal assistant can allow for two-way conversations with the respective user. A user or the corresponding client device can initiate a conversation to request a specific service. Considering the context of the conversation and the specified user intent with respect to the requested service, the conversation between the client device and the virtual personal assistant presents an opportunity for targeted advertisement or sponsored content. In

particular, sponsored content related to the user's requested service can be presented to the user during the conversation.

Systems and methods described herein allow for monetization of the virtual personal assistant by offering sponsored content related to a service requested by a user for presentation to that user. The sponsored content can be provided in the form of audio content, visual content, or a combination thereof. A user requesting a service from a specific service provider can be provided sponsored content indicative of offers of the same service by alternative service providers. The sponsored content provides additional service options (or deals) to the user, and allow the operator of the virtual personal assistant to monetize the use of the assistant through advertising revenue.

FIG. 1 is flowchart illustrating an example method 100 for selecting and providing sponsored content responsive to an input audio signal triggering an online action. The method 100 can be performed by the data processing system hosting the backend of a virtual personal assistant and/or serving sponsored content. At step 105 the method 100 can include identifying a user request based on a received input audio signal. The input audio signal can be received by a client device and can be indicative of a request or command made by a corresponding user. The user can initiate a conversation with an instance of the virtual personal assistant (e.g., Google Assistant). The user can make a request for an online service or action (e.g., an audio search query, request for making or checking an airline flight reservation, request for online purchase of movie tickets, request for rendering of an online live stream, request to schedule a cab service, etc.). The client device can receive the input audio signal via a respective microphone, and transmit the received input audio signal to the data processing system. A natural language processor (NLP) component of the data processing system can process the input audio request to

identify the user request. The NLP component can machine-translate the audio query to a corresponding text and parse the generated text to identify one or more keywords.

For example, the audio signal detected by the client device can include “Okay device, I need a ride with Uber to go to 1234 Main Street.” In such example, the data processing system can identify the trigger keywords “I need,” “to go to” and/or “ride,” and determine a user request for a cab ride. The data processing system can identify the word(s) following the “with” (e.g., “Uber”) as the desired service provider, and the words following “go to” (e.g., “1234 Main Street”) as the destination address. If the input audio signal does not include the pick-up address, the data processing system may deduce that based on location information of the client device transmitting the input signal. Also, the data processing system can assume that the user needs the ride now if no timing information is mentioned in the audio signal. In another example, the input audio signal may include “I need a plane ticket with United from Boston to Chicago on June 20 and coming back on June 24.” The data processing system can identify based on the keywords “plane ticket” that user is requesting to purchase or reserve a plane ticket. The data processing can determine based on the words “from” and “to” that the departure city is Boston and the destination city is Chicago. The data processing system can further identify “June 20” and “June 24” as dates of a round-trip flight.

At step 110, the data processing system can execute an online action responsive to the identified user request. Executing the online action may include generating an action data structure and transmitting the generated action data structure to the service provider specified in the input audio signal. For example, the data processing system can fill in an Uber ride request template and transmit the template to a computing device of Uber, responsive to the user request related to Uber ride. Executing the online action may include conducting an online search. For

instance, responsive to the user request for the plane ticket, the data processing system can search a travel website for flights between Boston and Chicago on the dates specified in the input audio signal. Executing the online action may further include logging in to a user account or creating an account for the user with a service provider (e.g., an account with an e-shopping website, a streaming platform, a gaming platform, or the like).

At step 115, the data processing system can generate a response to the input audio signal based on the executed online action. In the case where an action data structure is generated and transmitted to a service provider computing device, the latter can respond to the action data structure with an indication of one or more potential services and/or a request for additional information. For instance, the Uber computing device can respond to the ride request with information identifying one or more available rides (e.g., with different cars or drivers) including estimated pick-up time(s), estimated ride price(s), car information, or a combination thereof. The Uber computing device may alternatively respond with a request for a desired ride type (e.g., type of car) or a desired price range. The data processing system can use information received from the service provider computing device to generate a response for sending to the user's client device. In the case where the online action includes conducting an online search, the data processing system may generate a response including search results for presenting to the user. The generated response may include a request for the user to select among one or more services or products, or a request to provide further information regarding a service or product requested in the input audio signal.

At step 120, the data processing system can select a sponsored content item based on a context of the identified user request. The sponsored content item can include an offer from another provider for a service or product requested by the user. The data processing system may

hold an auction for the service or product requested by the user among alternative providers (e.g., other than the provider specified by in the input audio signal). For example, the data processing system can publish the ride requested by the user (e.g., the pick-up location and the destination) for ride service providers to bid on the requested ride. Publishing the requested ride can include the data processing system transmitting the generated action data structure to one or more other ride service providers with requests for bids. The other (or alternative) ride service providers (e.g., Lyft) can respond with bid values and offers for the requested ride service. Each offer can include an indication of a pick-up time, an estimated price for the ride service, and a bid value for having the respective offer presented to the user via the respective client device. The data processing system can select one or more of the received offers to create a sponsored content item for presenting to the user. The sponsored content item can include information indicative of the offer(s) from the alternative provider(s). The selection can be based on the bid values or specifics of the offers (e.g., pick-up time and/or price). The data processing system can create the sponsored content item as an audio content item, a visual content item (e.g., a text message, picture, or combination thereof, or an audio visual (e.g., video or animation) content item.

The sponsored content item may include an ad associated with an alternative service provider. For example, the ad can be related to a promotion or a coupon by an alternative airline company. The data processing system can hold an auction of ads related to airline tickets, car rental services, hotels, restaurants, things to do, and/or places to see in Chicago. The data processing system can select one or more ads based on respective bid values, ad formats (e.g., audio or visual), and/or other criteria such as user preferences or user profile. The data processing system may machine-translate a selected text ad to a corresponding audio ad.

At step 125, the data processing system can transmit the generated response and/or the selected sponsored content item for presentation to the user. The data processing system may generate both the generated response and the selected sponsored content item as audio signals within an audio file. The data processing system may apply sound and/or audio effects to the audio sponsored content item to allow the user to distinguish it from the generated response. The generated response and/or the selected sponsored content item can include one or more audio elements and one or more visual elements. The visual element(s) may include a text message, an image, a URL of a landing page, a video or animation segment, or a combination thereof. The data processing system may transmit different elements to separate client devices of the user or to separate interfaces of a single client device. For example, the data processing system may transmit the audio element(s) to the client device that initiated the conversation with the virtual personal assistant (e.g. a Google Home device), and transmit the visual element(s) to another client device such as a smart phone, a tablet, a laptop, a desktop, or a display device associated with the user. The client device(s) can play the audio element(s) and/or display the visual element(s) to the user.

The user can respond by an instruction or command to confirm or select one of the offers (or offered services) in the response generated by the data processing system or the sponsored content item. For example, the user may select a ride by Uber indicated in the generated response or a ride by another ride service provider (e.g., Lyft) indicated in the sponsored content item. In another example, the user may provide an instruction to select or confirm a round-trip ticket by United Airlines (e.g., the originally requested airline company) or a ticket offered within the sponsored content item by another airline company. The user may provide additional

information requested by the data processing system. The client device can transmit the user's instruction as a second audio signal to the data processing system.

Upon receiving the user instruction, the data processing system can communicate with a computing device associated with the selected service provider to confirm the user selected service or offer. The data processing system may execute a transaction (e.g., purchase the plane ticket) with the computing device of the selected service provider, responsive to the user instruction. The data processing system can also charge the service provider(s) associated with the selected sponsored content item(s) for the corresponding bid values.

The selection and providing of sponsored content responsive to user input audio signals triggering online actions, as described herein, allows for improved user experience in terms of the content presented users. Also, offering the sponsored content based on user requests allows for efficient targeted advertisement and monetization of the virtual personal assistant.

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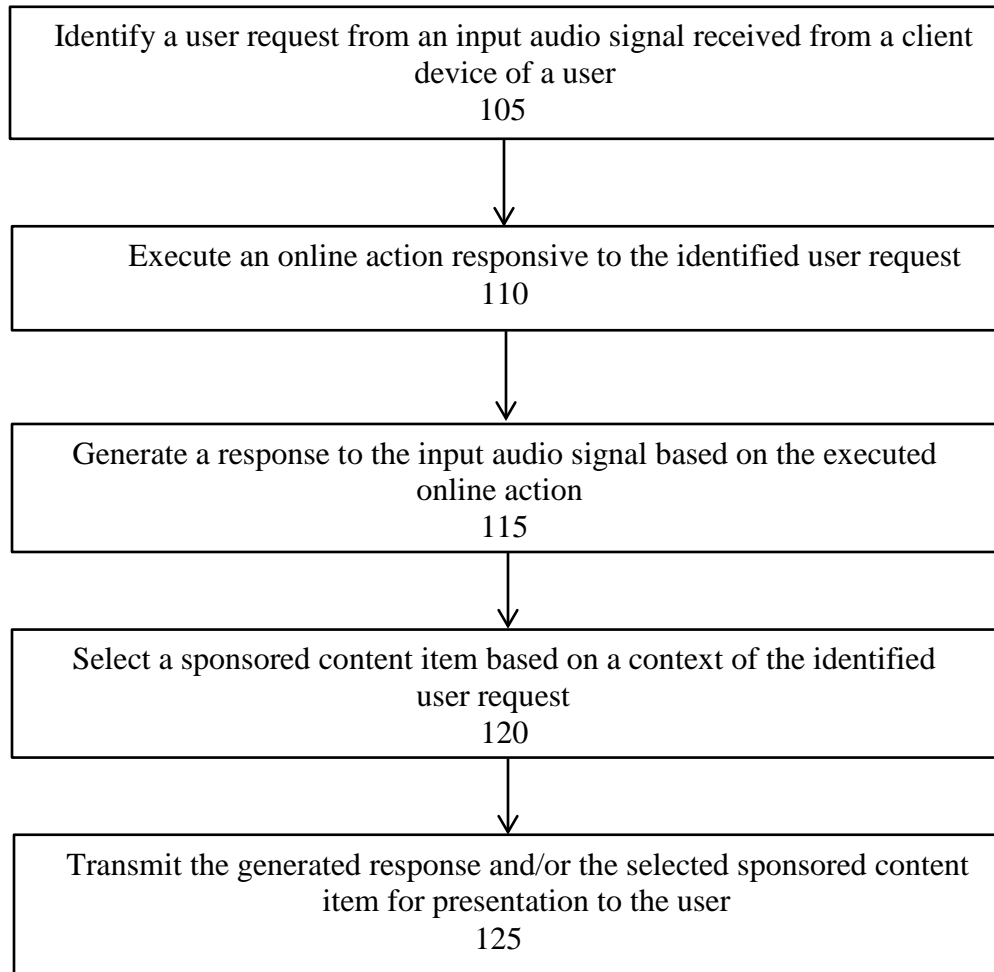



FIG. 1