September 29, 2017

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Recommended Citation

"AUDIBLE INDICATOR WHEN A THIRD PARTY ENTERS AN ASSISTANT CONVERSATION", Technical Disclosure Commons, (September 29, 2017)
http://www.tdcommons.org/dpubs_series/700

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AUDIBLE INDICATOR WHEN A THIRD PARTY ENTERS
AN ASSISTANT CONVERSATION

ABSTRACT

In some cases, a user may primarily interacts with an interactive assistant, referred to herein as “an interactive assistant,” “a virtual assistant,” or simply “an assistant,” via voice communications. An interactive assistant may receive input that includes requests for the interactive assistant to perform actions, and the interactive assistant may provide feedback to the user via audible output. An interactive assistant that interacts with third-party services when performing the requested actions may output various audible indications to indicate the state of its interaction with the third-party services.

DESCRIPTION

An interactive assistant, such as shown in the example of Figure 1 below, may be included in a computing system that is configured to interact with one or more users. The computing system may be, include, or otherwise be included in a mobile device (e.g., smart phone, tablet computer, laptop computer, computerized watch, computerized eyewear, computerized gloves), a personal computer, a smart television, a personal digital assistant, a portable gaming system, a media player, a mobile television platform, an automobile navigation and/or entertainment system, a vehicle (e.g., automobile, aircraft) and/or cockpit display, or any other type of wearable, non-wearable, mobile, or non-mobile computing device, and the computing system may or may not include a display device. In some cases, the interactive assistant may be a voice-assistant that receives audible user commands, processes the commands
based on speech recognition operations, and performs corresponding actions, such as providing audible responses to user queries and/or performing certain actions. The interactive assistant may provide or utilize a user interface with which a user can communicate to cause the assistant to output useful information, respond to a user’s queries, or otherwise perform certain operations to help the user complete a variety of real-world or virtual tasks.

Figure 1

Figure 1 above illustrates an example of an interactive assistant that is configured to output audible indications as the interactive assistant interacts with third-party services to
perform actions requested by the user. The computing system that includes the interactive
assistant may have or otherwise be communicatively coupled to one or more input devices and
one or more output devices. For instance, the input devices may include one or more
microphones, a presence-sensitive input device (e.g., a touch-sensitive screen), a mouse, a
keyboard, a voice responsive system, a camera, or any other type of device for detecting input
from a human or machine. In some cases, the input device may one or more location sensors
(GPS components, Wi-Fi components, cellular components), one or more temperature sensors,
one or more movement sensors (e.g., accelerometers, gyroscopes), one or more pressure sensors
(e.g., barometer), one or more ambient light sensors, and/or one or more other sensors (e.g.,
camera, infrared proximity sensor, hygrometer, and the like). Other sensors may include a heart
rate sensor, magnetometer, glucose sensor, hygrometer sensor, olfactory sensor, compass sensor,
step counter sensor, to name a few other non-limiting examples.

The computing system may also include or be communicatively coupled to one or more
output devices, such as one or more speakers or display screens, including a presence-sensitive
screen (e.g., touchscreen), or any other type of device for generating output to a human or
machine. In some cases, the input devices and/or output devices may include one or more other
type of wearable, non-wearable, mobile, or non-mobile computing devices that are also used by
the user. One or more of the input and/or output devices may be external to and communicatively
coupled (e.g., via a wired or wireless connection) with the computing system.

The computing system may also include a user interface module that is configured to
manage inputs received by the interactive assistant as users interact with the computing system,
and the user interface module may be configured to receive additional instructions from
applications, services, platforms, or other modules of the interactive assistant that process user input. The user interface module may also be configured to process output that is provided to users, and may be coupled to the input device(s) and output device(s) of the interactive assistant. The computing system may also include a speech recognition module, which may interface with the user interface module and/or the interactive assistant. When a user provides audible input to the interactive assistant (e.g., via commands, questions, queries, and requests), the interactive assistant may use the speech recognition module to process such audible input.

The interactive assistant may receive from the user a request to perform an action and, in response, may interact with third-party services to perform the requested action. A third-party service may be an application, service, process, and the like provided by a vendor other than the manufacturer of the device, which may send and receive data to and from external computing systems. For example, the interactive assistant may interact with a ride sharing service in response to receiving a request to book a ride to the airport, or may interact with an airline booking service in response to receiving a request to book a flight.

The interactive assistant may notify the user aware that it is currently interacting with a third-party service by outputting audible indications via the output devices (e.g., speakers) of the computing system to indicate the state of its interaction with third-party services. An audible indication may be a tone, a chime, a beep, audible cue, or any other sound. By notifying the user that it is currently interacting with a third-party service, the interactive assistant may prevent the user from unintentionally providing voice input to the interactive assistant that may then be passed onto the third-party service.
The interactive assistant may receive a request from the user, such as “book me a flight from San Francisco to New York City next Friday” and, in response, may invoke a third-party flight booking service to service the request. In some examples, the user’s request may specify the specific third-party service the user would like to use, such as “book me a flight from San Francisco to New York City next Friday using airline booking service ABC.”

In response to being invoked by the interactive assistant, the third-party service may make a request to the interactive assistant to join the conversation between the interactive assistant and the user. The third-party service joins the conversation so that it can converse with the user (i.e., receive input from the user and provide output to the user) via the interactive assistant.

When the third-party service makes such a request to join the conversation, the interactive assistant may output an audible indication that the third-party service has requested to join the conversation. When the third-party service has successfully joined the conversation (i.e., upon the interactive assistant accepting the third-party service’s request to join the conversation), the interactive assistant may also output an audible indication that the third-party service has joined the conversation.

When the third-party service has joined the conversation, the interactive assistant may periodically output audible indications (e.g., every 30 seconds) to indicate that the third-party service is still joined in the conversation. Further, the interactive assistant may also output an audible indication upon the third-party service taking an action when joined in the conversation, such as when the third-party service starts a recording or otherwise notes a part of the conversation with the user, when the third-party service makes a purchase or a financial
transaction as a part of the conversation, when the third-party service is on hold or waiting, and
the like.

The third-party service can converse with the user through the interactive assistant. For example, the third-party service may direct the interactive assistant to output to the user “now searching for flights between San Francisco and New York City next Friday.” As the third-party service searches for flights, the interactive assistant may output audible indications to indicate that the third-party service is currently busy processing and/or performing an action. When the third-party service has finished its search for flights, the interactive assistant can output an audible indication to indicate that the third-party service has finished its processing and/or performance of the action.

The third-party service may cause the interactive assistant to output “The cheapest fare that I found is $400. Would you like to purchase tickets?” In response, the interactive assistant may output an audible indication to indicate that the third-party service is waiting for a reply from the user. While the third-party service waits for a reply from the user, the interactive assistant may periodically play audible indications to indicate that the third-party service is still waiting for a reply from the user.

The user may provide a reply, such as “book that fare.” In response, the interactive assistant may output an audible indication to indicate that the third-party service has acknowledged the user’s reply. When the third-party service has booked the fare, which may include charging the price of the fare to the user’s credit card after the user’s explicit permission to do so, the interactive assistant may output an audible indication to indicate that the third-party service has charged the user’s credit card and has booked the fare. After booking the fare, the
third-party service may exit the conversation, and the interactive assistant may output an audible indication to indicate that the third-party service has left the conversation.

The audible indications described above may be the same or may be different. In other words, some of the audible indications may be the same audible indication (e.g., the same tone, chimes, and the like), while other audible indications may differ from each other (e.g., different tones, chimes, and the like). For example, interactive assistant may a specify a set of default audio indications for certain actions, such as for when a third-party service joins the conversation, when the third-party service exits the conversation, and the like. The default tones for these actions may be the same audible indication, or may be different.

In some examples, the audible indications may be explicitly specified by the user (e.g., set through system settings or user preferences), set by specific third-party services, or may even be learned based on user behavior and other signals and/or contexts. For example, the interactive assistant may learn the musical preferences of the user (e.g., the genre of music that the user tends to listen to) and may output audible indications that are similar to the music that the user listens to. In other examples, the interactive assistant may output audible indications based on the user’s location, the time of the day, the user’s current activity, the user’s environment (e.g., outputting louder audible indications if the user is in a noisy environment), and the like.

It should be understood that the interactive assistant may track or otherwise determine the user’s behavior as well as other signals and/or contexts only after receiving explicit permission by the user to do so. That is, a user may be provided with controls allowing the user to make an election as to both if and when the assistant, the computing device, or the computing systems described herein can collect or make use of supplemental data (e.g., user information or
contextual information about a user’s social network, social actions or activities, profession, a user’s preferences, or a user’s current location), and if and when 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 supplemental data is collected about the user, how that supplemental data is used, and what supplemental data is provided to the user.