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CREATION OF MUSIC PLAYLISTS USING AN INTERACTIVE ASSISTANT

ABSTRACT

An interactive assistant, referred to herein as “an interactive assistant,” “a virtual assistant,” or simply “an assistant,” may be configured to create artist-specific or other criteria-based music playlists based on queries from a user. For example, an interactive assistant may accept queries from a user, perform a search of songs and related content based on certain criteria specified in the queries, and generate or modify music playlists based on the search results. The interactive assistant may also execute one or more applications, such as a music application, to play the songs included in the generated playlists.

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, a home or other smart appliance and/or related device (e.g., interconnectable appliance/device via Internet of Things), 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.

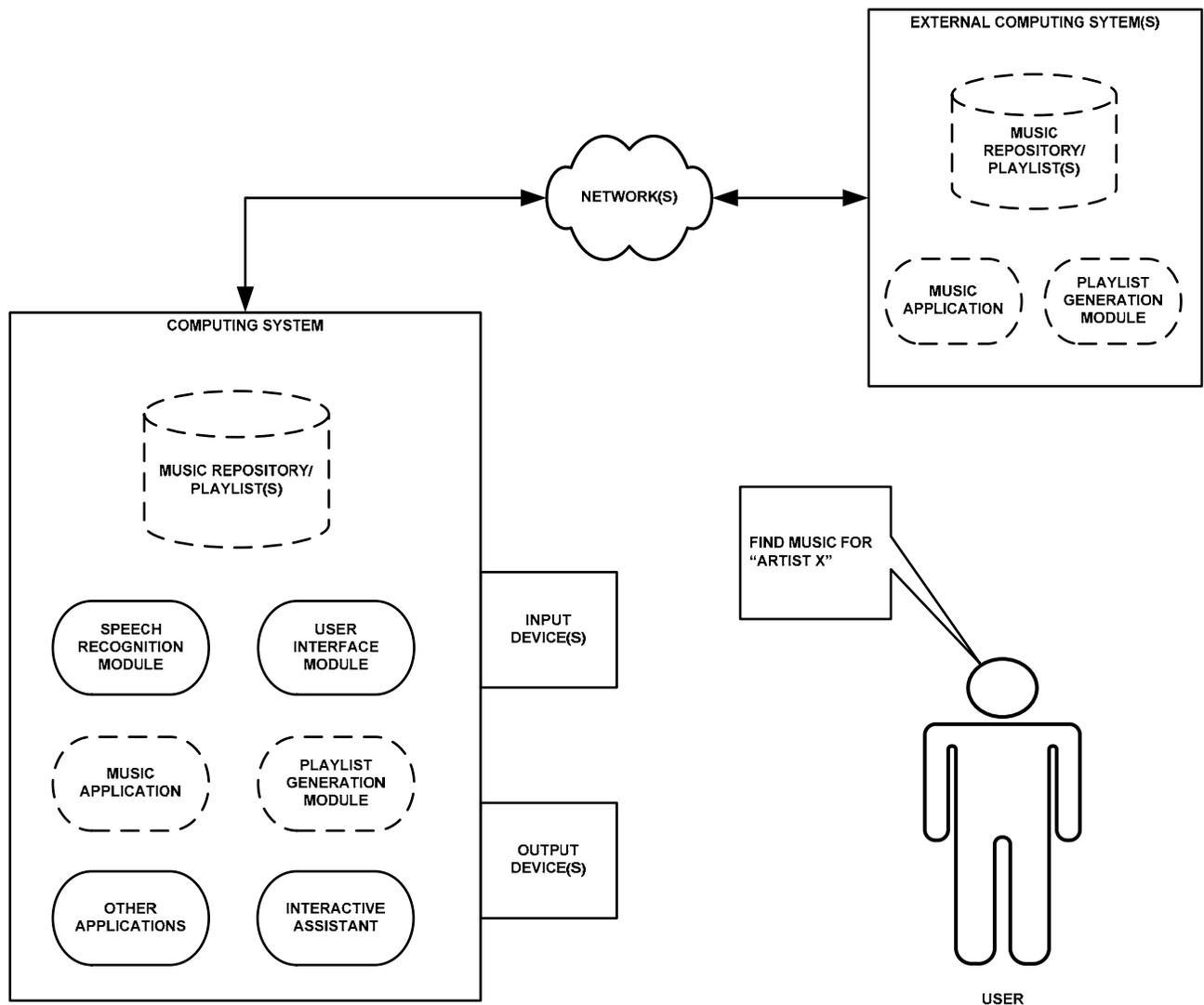


Figure 1

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 above illustrates an example of an interactive assistant that is configured to create artist-specific or other criteria-based playlists based on queries from a user. The interactive assistant may accept queries from a user, perform a search of songs and related content based on certain criteria specified in the queries, and generate or modify playlists based on the search results.

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 and/or 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 and/or a 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), the interactive assistant may use the speech recognition module to process such audible input.

As described herein, the speech recognition module, user interface module, and interactive assistant are configured to utilize and/or process information received from the input devices only after receiving explicit authorization from the user to do so. The computing system may provide the user (e.g., via the user interface module and/or the interactive assistant) with

detailed information about the requested use of data collected by input devices for use by the interactive assistant, in conjunction with the use of specified functions or applications (e.g., one or more of the search application, content delivery applications, or other applications). The speech recognition module, user interface module, and/or interactive assistant only use such data collected by input devices after receiving explicit authorization from user to do so. After receiving such authorization, these modules are configured only to use the data gathered by the input devices for the use or uses authorized by the user.

Further to the descriptions below, a user may be provided with controls allowing the user to make an election as to if and when the interactive assistant, the computing system, and/or the external 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 computing system. 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.

While interacting with the user, the interactive assistant may receive queries from the user and, in some cases, generate artist-specific or other criteria-based playlists using a playlist generation module. For example, the user may issue a query, such as the one shown in Figure 1, to “Find music for ‘Artist X.’” In this case, the computing system may include or otherwise invoke (e.g., via one or more external computing systems shown in Figure 1) a playlist generation module that searches one or more music repositories to identify songs associated with “Artist X.” These music repositories may be stored locally on the computing system and/or on the one or more external computing systems illustrated in Figure 1, which are communicatively coupled to the computing system via one or more networks (e.g., wired and/or wireless networks). The music repositories may include song content as well as other related information (e.g., metadata) associated with the song content, such as artist information, song title information, song theme information, lyric information, instrument information, composer/producer information, album/soundtrack information, duration information, and the like.

Upon identifying any songs associated with “Artist X,” the playlist generation module may add these songs to a generated music playlist associated with “Artist X.” The interactive assistant may associate this playlist with the particular user who submitted the query, such that the assistant may maintain playlists on a user-by-user basis. Any generated playlist may include information associated with each of the songs included in the playlist, such as artist information, song title information, song theme information, lyric information, instrument information, composer/producer information, album/soundtrack information, duration information, and the

like. The interactive assistant may store the music playlist locally and/or on the one or more external computing systems.

As indicated above, in some cases, the one or more external computing systems shown in Figure 1 may store music repositories and playlists. The external computing systems may also execute the playlist generation module. In such cases, upon receiving a query, the interactive assistant may request that the one or more external computing systems generate one or more playlists, which may be stored on the external computing systems and/or on the local computing system.

In other examples, the user may specify any other criteria in a submitted query. For example, the user may specify criteria associated with a song title, a song theme, song lyrics, composer/producer information, and the like. The playlist generation module may then search the one or more music repositories to identify songs associated with the user-specified criteria.

At any point in time, the user may execute a music application via the interactive assistant. The playlist generation module may also execute the music application. In some cases, the music application or service may execute locally on the computing system, and in other cases, the music application may execute on external computing systems, as shown in Figure 1. The music application may access the music playlists stored locally on the computing system and/or any music playlists that are stored on external computing systems. The music application may output (e.g., visually, audibly), via output devices, playlist information to a user, including any playlists that were previously generated by the playlist generation module. The

user may select a given playlist to begin listening to any of the songs included in the playlist, which may be output via the output devices.

When the music application executes remotely from the computing system, such as on the one or more external computing systems shown in Figure 1, the music application may stream songs to the computing system for output at the output devices. In some cases, the computing system may also download one or more songs from the external computing systems, which may then be output by computing system even when it is offline or otherwise disconnected from the external computing systems.

The user may view information about a playlist and any information about the songs included in the playlist (e.g., artist information, song title information, song theme information, lyric information, instrument information, composer/producer information, album/soundtrack information, duration information), and may also sort the playlist according to similar criteria. In addition, one or more other applications that execute on the computing system may also have access to and use generated music playlists.

Using the example described above and illustrated in Figure 1, in which the interactive assistant generated an artist-specific playlist for “Artist X,” the music application and/or other applications may output one or more songs for this artist “Artist X” using the artist-specific playlist. The user may use the music application to play any of the songs included in the artist-specific playlist.

The user may also modify an existing, previously generated playlist by specifying one or more fields and/or criteria in a subsequent query. For example, if the user had previously

requested generation of a playlist for music by “Artist X,” the user may later request that the playlist be modified to include only songs by “Artist X” that were released prior to the year 2000. In this case, the playlist generation module may use information (e.g., tags, metadata) associated with the songs in the originally generated playlist to modify the playlist and include only those songs by “Artist X” that were released prior to the year 2000. In such fashion, the playlist generation module is able not only to generate new playlists based on user queries, but also to modify existing playlists, even while the applications are accessing or these playlists or playing songs included in the playlists.

As another example, the user may specify a combination of artists or other criteria in a query. For example, the user may wish to only include songs in a given playlist if both “Artist X” and “Artist Y” are associated with these songs. Upon receiving such a query, the playlist generation module may either create a new playlist or modify an existing playlist to include only those songs in which both “Artist X” and “Artist Y” perform (e.g., as singers and/or musicians). As yet another example, the user may provide one or more exclusionary criteria in a given search query. For instance, the user may only wish to include songs in a given playlist if “Artist X,” but not “Artist Y,” is associated with the songs. Upon receiving such a query, the playlist generation module may either create a new playlist or modify an existing playlist to include only those songs in which “Artist X” but not “Artist Y” performs.