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ASSISTANT ENABLED ENTERTAINMENT SYSTEM

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ABSTRACT

A virtual, intelligent, or computational assistant (e.g., also referred to simply as an "assistant") is described that relies on supplemental data (e.g., contextual information, user information, etc.) to determine media, including movies, television shows, music, etc., that a user may want to consume and provide recommendations or automatically perform actions based on to assist the user in consuming the media. With explicit permission from a user, the assistant may access a user's location history, calendar, e-mail, messages, past assistant interactions, contacts, photos, search history, sensor data, social network accounts, and other contextual or user information develop recommendations. The supplemental data can be stored locally on a device that is executing the assistant or in a cloud computing environment that is accessible to the assistant from the device. This way, the assistant can better understand what kinds of media a user may be interested in consuming and automatically make recommendations for, or take specific actions on, specific media that will satisfy the user's interest, without requiring the user to search for, pre-record, or otherwise be aware that such media exists.

DESCRIPTION

Virtual, intelligent, or computational assistants (e.g., also referred to simply "assistants") execute on counter-top computing devices, mobile phones, automobiles, and many other types of computing devices. Assistants output useful information, responds to user queries, or otherwise perform certain operations to help users complete real-world and/or virtual tasks. The usefulness of an assistant may depend on what information the assistant already knows about its users or what information the assistant has access to.

The example system shown in FIG. 1 provides an assistant architecture that that relies on supplemental data, including contextual information and user information, when making media recommendations and/or performing automated tasks to aid a user in consuming media. That is, with explicit permission from a user, the assistant may access a user's location history, calendar, e-mail, messages, past assistant interactions, social media networks, contacts, photos, and other contextual or user information that is outside the assistants typical control, to recommend media or perform an action to aid in a user's consumption of the media. The contextual information can be stored locally on a device that is executing the assistant or in a could computing environment that is accessible to the assistant from the device. This way, the assistant can better understand what kinds of media a user may be interested in consuming and automatically make recommendations for, or take specific actions on, specific media that will satisfy the user's interest, without requiring the user to search for, pre-record, or otherwise be aware that such media exists.

Further to the descriptions below, 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.

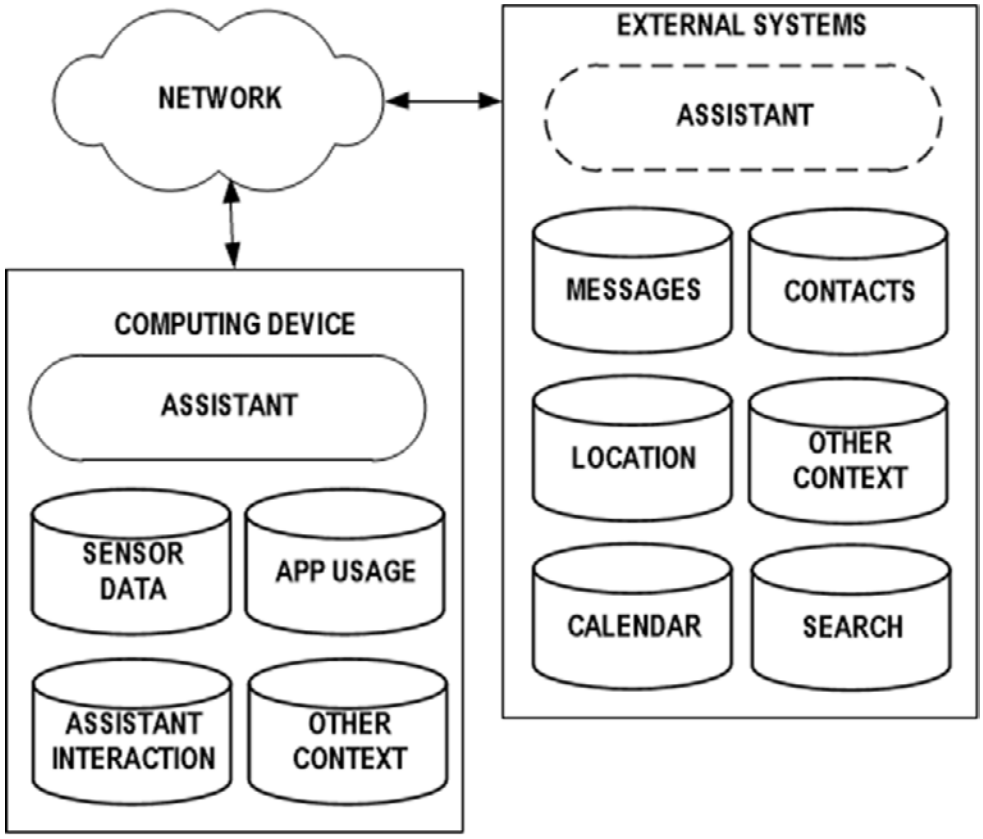

FIG. 1

The system of FIG. 1 includes one or more external systems and a computing device communicating across a network to provide an assistant service that maintains and has access to user information. The network of FIG. 1 represents a combination of any one or more public or private communication networks, for instance, television broadcast networks, cable or satellite networks, cellular networks, Wi-Fi networks, broadband networks, and/or other type of network for transmitting data (e.g., telecommunications and/or media data) between various computing devices, systems, and other communications and media equipment.

The computing device represents any type of computing device that is configured to execute an assistant and communicate on a network. The external systems represent any type of server or other computing system that is configured to support the assistants executing at the computing device. The external systems and computing device can be personal computing devices. In some examples, the computing device and external systems may be shared assets of multiple users. Examples of the computing device and the external systems include cloud computing environments, mobile phones, tablet computers, wearable computing devices, countertop computing devices, home automation computing devices, laptop computers, desktop computers, televisions, stereos, automobiles, and all other type of mobile and non-mobile computing device that is configured to execute an assistant.

The computing device and external systems may store or provide access to supplemental data including personal information about users. Examples of personal information include: sensor data, calendars, location histories, social network information, search histories, messages, e-mails, preferences, notes, lists, contacts, other communications, interests, application usage data, past assistant interactions, etc. After receiving explicit permission from a user, the computing device and external systems may store the supplemental data and enable an assistant, or other applications, executing at the computing device and external systems to access the supplemental data.

The external systems and the computing device treat the supplemental data so the supplemental data is protected, encrypted, or otherwise not susceptible to unauthorized access or unauthorized use. The supplemental data may be stored locally at the computing device and/or remotely (e.g., in a cloud computing environment provided by the external systems and which is accessible via the network of FIG. 1).

The computing device includes an assistant that executes across the external systems and the computing device to provide assistant services to users of the computing device. Examples of assistant services include: setting up reminders, creating calendar entries, booking travel, online ordering, sending messages or other communications, controlling televisions, lights, thermostats, appliances, or other computing devices, providing navigational instructions, or any other conceivable task or operation that may be performed by an assistant. The assistant relies on the supplemental data stored on the computing device or the external systems when interpreting, and determining answers to, user queries.

The following examples are primarily described below in the context of the computing device being a television or a media streaming device connected to a television. However, the following examples are applicable to any other type of computing device configured to execute an assistant.

In general, the assistant understands what one or more users may like based on supplemental data and may either pre-record, add to a watch list, or recommend in near real-time, that a user consume a particular piece of media. For example, the assistant may determine from communications of the user that the user's child niece is coming over and therefore recommend one or more movies that would be suitable for her age, interest, or demographic. Similar, the assistant may determine from the user's communications, social media posts, calendar, or other supplemental data that the user's girl friend is coming over. The assistant may recommend one or more different movies that would be suitable for couples to watch.

The assistant may make recommendations that change dynamically based on changes in the supplemental data used. For example, based on sensor data, the assistant may determine that auditory patterns have changed and the people in the room together currently consuming media

are different than before. The assistant may update its media recommendations to overlap interests of the people in the room. For instance, while a user is alone in a room watching television, the assistant may output recommendations based on that user's interests. Whereas, when the assistant determines that other people have entered the room, the assistant may no longer recommend media that is particular to that user, but instead, that would be generally of interest to the user's demographic or circle of friends.

The assistant may vary recommendations based on perceived mood, time of day, viewing patterns, and other contextual information that may change over time. For instance, the assistant may observe user behavior that when raining outside, the user prefers to watch horror movies at night as opposed to when its not raining the user generally watches action or comedies. The assistant, in some implementations, may observe that the user watches sitcom reruns when he or she arrives home and is in the kitchen (e.g., prepping dinner) whereas when the user wakes in the morning and is prepping breakfast on weekends, he or she likes to watch quiet documentaries and new magazine shows. The assistant may generate rules based on the learned behavior of the user so that media recommendations and actions are taken in furtherance of the rules. As one example, the assistant may prerecord a particular new magazine show that airs on Friday night for the user to watch on Saturday morning when the assistant infers from location or auditory information that the user is not home on Friday night.

The assistant may manage a user's equipment based on inferred user preferences and behavior. For example, the assistant may determine based on viewing behavior that the user likes to watch sports at a high-volume level and tends to mute the television during commercial breaks. Rather than require the user to manually adjust the volume, the assistant may

automatically adjust the volume of the television when the assistant determines the user is watching sports and automatically cut the audio when there is a commercial break.

As another example, the assistant may determine that the user is reading an email or text message from a friend. In the communication, the user or friend may reference show or movie, and the assistant may use that reference to then prerecord the show or movie if the user is not watching the show or movie when it airs, or later recommend that the user watch that show or movie.

As a final example, the assistant may determine that when the user is watching a show alone, he likes to watch in the dark. The assistant may automatically turn the lights off without requiring the user to control the lights in response to the assistant determining that the show is playing. Likewise, the assistant may determine that when the user is watching the show with his mom, she insists that the end table lamps are turned on. The assistant may automatically turn the end table lamps on without requiring the user to control the lights in response to the assistant determining that the show is playing and the user's mom is present in the room.

By relying on supplemental data, the assistant can better understand a user's interests, and with regards to media, perform actions or make recommendations that are more likely to be appreciated by the user. The above examples are just some use cases for the assistant architecture shown in FIG. 1, the assistant architecture has many other applications and use cases.