SIGNAL ANALYSIS IN A CONVERSATIONAL SCHEDULING ASSISTANT COMPUTING SYSTEM

CROSS-REFERENCE TO RELATED APPLICATION

The present application is a continuation of and claims priority of U.S. patent application Ser. No. 15/714,077, filed Sep. 25, 2017, the content of which is hereby incorporated by reference in its entirety.

BACKGROUND

[0001] Computing systems are currently in wide use. Some computing systems include such things as electronic mail (e-mail) computing systems, calendaring or scheduling computing systems, among a wide variety of others.

[0002] Also, some computing systems include digital agents, or personal digital assistants. These types of agents or assistants can include, for example, software agents or other bots that are computer programs that may provide an interface for human interaction, using natural language, and that may perform various tasks. They illustratively use natural language understanding logic to identify a linguistic meaning of the natural language inputs and to perform certain tasks for the user, automatically, based upon those natural language inputs. For instance, based on a natural language input, the agent or assistant can set reminders, answer questions by performing searches, interact with other services, among other things.

[0003] In performing these tasks, such agents or bots are often involved in conducting a conversation with a user in order to perform a service. For instance, some bots or agents may be used when a user is having a conversation with other users. By way of example, assume that a first user sends an electronic mail message (an e-mail message) to a group of other users asking whether they wish to see a movie or attend other entertainment on a particular date. In order to find activities that are available, it may be that one of the users or the group also sends an e-mail message (cc'ing all other users in the group) to a software agent that is configured to identify entertainment that is taking place at different venues on different dates. The software agent then surfaces, for the group, a set of entertainment activities that are taking place on that date, and may also assist the group in obtaining tickets. By way of example, the software agent may send an e-mail to the entire group indicating the set of entertainment activities and asking whether the software agent should procure tickets. If directed to do so, the software agent may conduct a dialog with one or more of the users to identify the number of tickets, the amount to be spent on the tickets, among other things. The software agent may then interact with a ticketing site to obtain the tickets.

[0004] It can be difficult to improve such computing systems, because it can be difficult to know what features the various users are satisfied with, and what features they

What is claimed is :

1. A method performed by an assistance computing system, the method comprising :

detecting a natural language request message from a user using a messaging system, wherein the natural language request message is indicative of a user request for a service;

conducting a dialog with the user, using the messaging system, to provide the service in response to the natural language request message, wherein conducting the dialog comprises rendering a set of messages from the service in response to a set of natural language messages from the user in the dialog and identifying a task in the service based on the set of natural language messages;

determining a satisfaction indicia indicative of user satisfaction corresponding to the assistance computing system based on content of at least one natural language message, other than the natural language request message, in the dialog; and

controlling the dialog based on the satisfaction indicia.

2. The method of claim 1, wherein determining the satisfaction indicia comprises :

performing linguistic processing on the natural language request message and the natural language message to determine the satisfaction indicia corresponding to a user concern with the assistance computing system.

3. The computer implemented method of claim 1, and further comprising :

generating a survey with the user to determine the satisfaction indicia.

4. The computer implemented method of claim 1, wherein the natural language request message comprises a request to schedule a meeting.

5. The computer implemented method of claim 1, wherein the user comprises a first user in a group of users, and conducting a dialog comprises :

conducting the dialog with the group of users.

6. The method of claim 1, further comprising :

determining the satisfaction indicia based on how often the user uses the assistance computing system.

7. The method of claim 1, wherein controlling the dialog comprises :

prompting the user to recommend the assistance computing system to another yser.

8. The method of claim 1, and further comprising :

detecting, when the user recommends the software agent to a second user.

9. The method of claim 1, and further comprising :

mining calendar data stored in a calendar data store; and

determining the satisfaction indicia based on how often the user uses the assistance computing system.

10. A computing system comprising :

a messaging system configured to send and receive messages with a user;

a software agent configured to :

conduct a dialog with the user, using the messaging system, to

provide a service in response to a natural language request message indicative of a user request,

render a set of messages from the service in response to a set of natural language messages from the user to the dialog, and

identify a task in the service based on the set of natural language messages;

a signal analyzer configured to generate a satisfaction indicia indicative of user satisfaction corresponding to the software agent based on the natural language request message and the message content in the dialog; and

control signal generator logic configured to generate a control signal to control the computing system based on the satisfaction indicia.

11. The computing system of claim 10, wherein the user comprises a first user in a group of users, and the software agent is configured to conduct the dialog with the group of users.

12. The computing system of claim 10, wherein the messaging system comprises an e-mail system.

13. The computing system of claim 10, wherein the messages with the user comprise group messages with a group of users.

14. The computing system of claim 10, wherein the signal analyzer comprises :

sentiment analysis logic configured to generate the satisfaction indicia corresponding to user sentiment based on the natural language request and the dialog.

15. The computing system of claim 10, wherein the signal analyzer comprises :

user recommendation logic configured to detect when the user recommends the software agent to a second user.

16. The computing system of claim 10, wherein the signal analyzer comprises :

calendar mining logic configured to mine calendar data stored in a calendar data store; and

service coverage determination logic configured to determine the satisfaction indicia based on how often the user uses the software agent.

17. The computing system of claim 10, wherein the signal analyzer comprises :

user concern detection logic configured to perform linguistic processing on the natural language message to determine the satisfaction indicia corresponding to user concern with the software agent.

18. A computing system, comprising :

at least one processor; and

memory storing instructions executable by the at least one processor, wherein the instructions, when excuted, cause the computing system to :

conduct a dialog with user, using a messaging system, to :

render a service in response to a natural language request message

indicative of a user request,

render a set of messages from the service in response to a set of natural

language messages from the user in the dialog, and

identify a task in the service based on the set of natural language

messages;

generate a satisfaction indicia indicative of user satisfaction corresponding to the computing system based on the natural language request message and one or more other natural language messages, other than the natural language request message, in the dialog; and

generate a control signal to control the computing system based on the satisfaction indicia.

19. The computing system of claim 18, wherein the instructions configure the computing system to :

perform linguistic processing on the natural language request message and one or more other natural language messages in the dialog to determine the satisfaction indicia corresponding to a user concern with the dialog.

20. The computing system of claim 18, wherein the natural language request message comprises a request to make a reservation.