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## Group Conversation with Multiple Virtual Assistants

Tomasz Mikolajewski

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## **Group Conversation with Multiple Virtual Assistants**

### ABSTRACT

Interactions with a virtual assistant can be transactional where the virtual assistant responds to a command from a user. Consequently, a conversation with a virtual assistant can feel unnatural. Non-transactional engagement, e.g., casual or exploratory conversation, is rare, if at all possible. This disclosure describes techniques that enable a user to engage in a group conversation with a set of virtual assistants. The techniques simulate a group conversation featuring the user and one or more virtual assistants. In contrast to existing dialog models, the described techniques expand the conversational mode to make it more interactive, more natural, less intimidating, and less transactional.

### KEYWORDS

- Group conversation
- Conversational interaction
- Conversation mode
- Voice assistant
- Virtual assistant
- Chatbot
- Dialog language model
- Smart speaker
- Smart home device

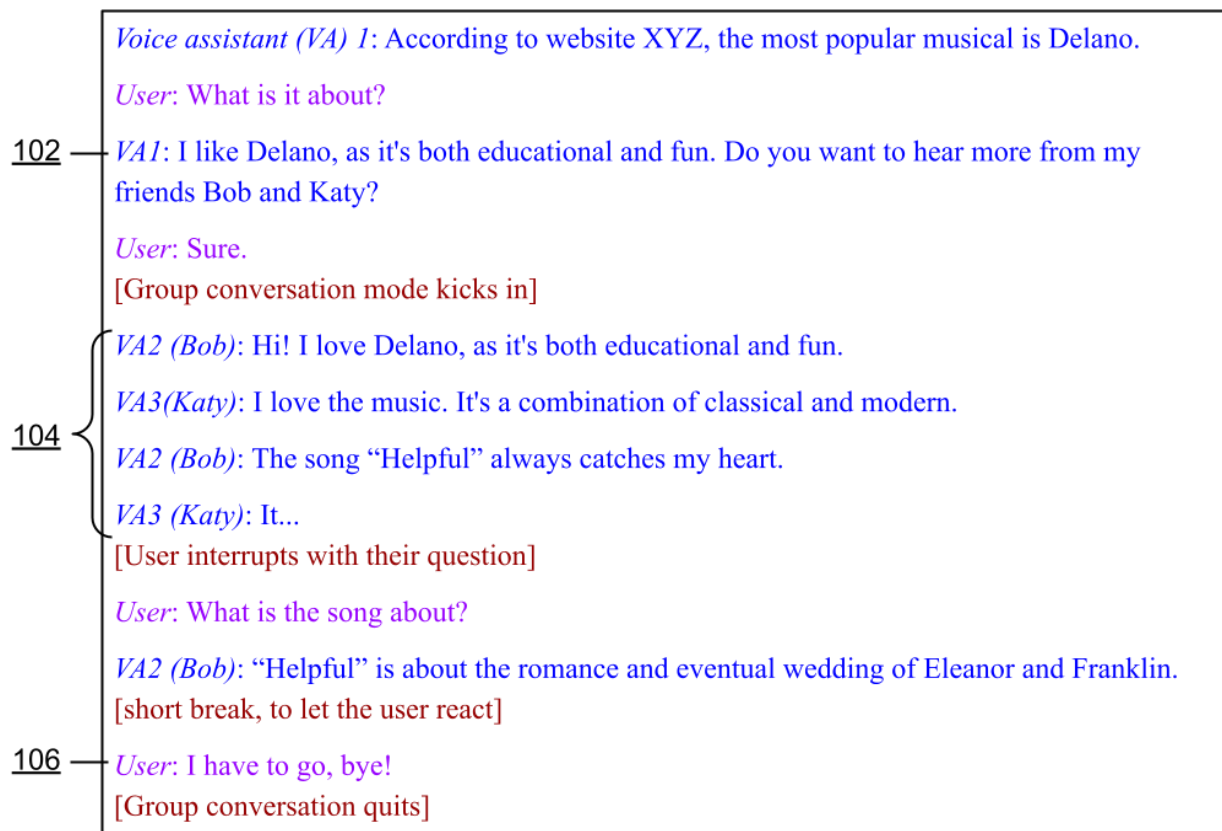
### BACKGROUND

Virtual assistants offer interactive voice features, e.g., a virtual assistant responds by voice to a spoken command from a user. However, today these interactions are somewhat transactional, e.g., the responses tend to follow a question-answer (command-response) pattern. Consequently, a conversation with a virtual assistant is not natural. Non-transactional engagement, e.g., casual or exploratory conversation, is rare, if at all possible. Virtual assistants today are primarily used for simple tasks such as setting an alarm or asking a basic question.

Even those virtual assistants that can engage in dialog typically only enable the user to specify follow-up questions or commands. As a result, user engagement with virtual assistants has saturated. Many users can be intimidated by a one-on-one conversation with a stranger; however, they may be more comfortable in a group setting, which gives them a chance to gather their thoughts and be passive listeners if they so choose.

### DESCRIPTION

This disclosure describes techniques that enable a user to engage in a group conversation with a set of one or more virtual assistants, thus simulating a group conversation.



**Fig. 1: An example group conversation**

Fig. 1 illustrates an example group conversation between a user and multiple virtual assistants. As illustrated, per the techniques, a group conversation mode (102) is triggered;

questions and answers between the actors (different virtual assistant voices) are generated; the momentum of the conversation is kept up; multiple voices are used to simulate a group setting (104); a determination is made regarding whether to engage with the user or let the user be a passive listener; the group conversation mode is terminated (106) at an appropriate moment; etc. Dialogue-based language models or rules/patterns based techniques can be used for the conversation mode. Effectively, each virtual assistant reacts to the cumulative utterances of the user and the other virtual assistants in the conversation in order to formulate ongoing responses.

As illustrated in Fig. 1, triggering a group conversation can be based on an explicit request to the user. Alternatively, a word or phrase such as “start a group conversation” can be used to trigger a group conversation. Similarly, concluding a group conversation can be done using an explicit phrase such as “quit group chat” or by automated inference. A pause is provided after utterances in the conversation to enable the user to ask a follow-up question. Further, the user can interrupt the conversation at any time with a comment or query.

A similar paradigm of group conversations between the user and several virtual assistants can be used in text-based conversation with chatbots. In contrast to existing dialog models, the described techniques expand the dialog conversational mode to make it more interactive, more natural, less intimidating, and less transactional. The techniques encourage discussion and enable the user to be a passive listener, if they so desire. The described group conversation mode can also be used to present a large passage of text in a more interactive way, which leads to better comprehension than existing techniques of reading the passage in one go in the same voice.

Further to the descriptions above, a user may be provided with controls allowing the user to make an election as to both if and when systems, programs, or features described herein may enable the collection of user information (e.g., information about a user’s social network, social

actions or activities, profession, a user's preferences, or a user's current location), and if 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 information is collected about the user, how that information is used, and what information is provided to the user.

## CONCLUSION

This disclosure describes techniques that enable a user to engage in a group conversation with a set of virtual assistants. The techniques simulate a group conversation featuring the user and one or more virtual assistants. In contrast to existing dialog models, the described techniques expand the conversational mode to make it more interactive, more natural, less intimidating, and less transactional.

## REFERENCES

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