Animated User Representatives in Support of Asynchronous Group Decision Making: Challenges for Dialog Processing

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Abstract

The goals of this demo are (a) to illustrate a novel application area for natural language dialog systems and (b) to discuss some of the issues that arise in the design of systems for this area.

1 Dialog Systems as Representatives of Absent Group Members

The system demonstrated, called the TRAVEL DECISION FORUM (see Jameson, Baldes, & Kleinbauer, 2003) helps three members of a group to agree on a single set of criteria that are to be applied in the making of a particular decision (e.g., what their planned joint vacation should be like). The system is intended for use in situations in which the group members cannot communicate face-to-face or with synchronous communication media.

When one group member interacts with the system, he or she sees two animated characters that represent the other two group members, who are not currently on-line (see Figure 1). These *representatives* respond with natural language and gestures to proposals made either by the *mediator* character or by the current user. Each proposal concerns a set of joint preferences concerning one aspect of the decision to be made. Each representative has a certain degree of authority to accept proposals on behalf of the corresponding real user.

A representative's responses to a proposal are based on the domain-specific *preferences* of the corresponding real group member (e.g., how important it is to have access to a beauty farm), which that member has previously specified by filling in electronic forms (see the lower right-hand corner of Figure 1).

The dialog behavior of a representative is also determined by a number of more general parameters that the real group member has set. These parameters determine, among other things, the way in which the representative takes the preferences of other group members into account when evaluating a proposal. For example, in Figure 1, Ritchie's representative is concerned about whether a proposal is more favorable for Tina than for Ritchie. The real user can specify not only how his or her representative *actually* evaluates proposals but also how it *appears* to evaluate them (cf. Jameson, 1989). For example, instead of allowing the rather childish-looking behavior shown in Figure 1, Ritchie might specify that his representative should argue as if Ritchie were concerned about the overall utility of each proposal for all group members.

By interacting with animated representatives of absent group members, the current user can enhance her awareness of the preferences and motivation of these group members. She can then generate proposals that have a good chance of being accepted by the other members and/or by their representatives. The current user can also change the specification of her own preferences and motivation so as to facilitate the reaching of consensus.
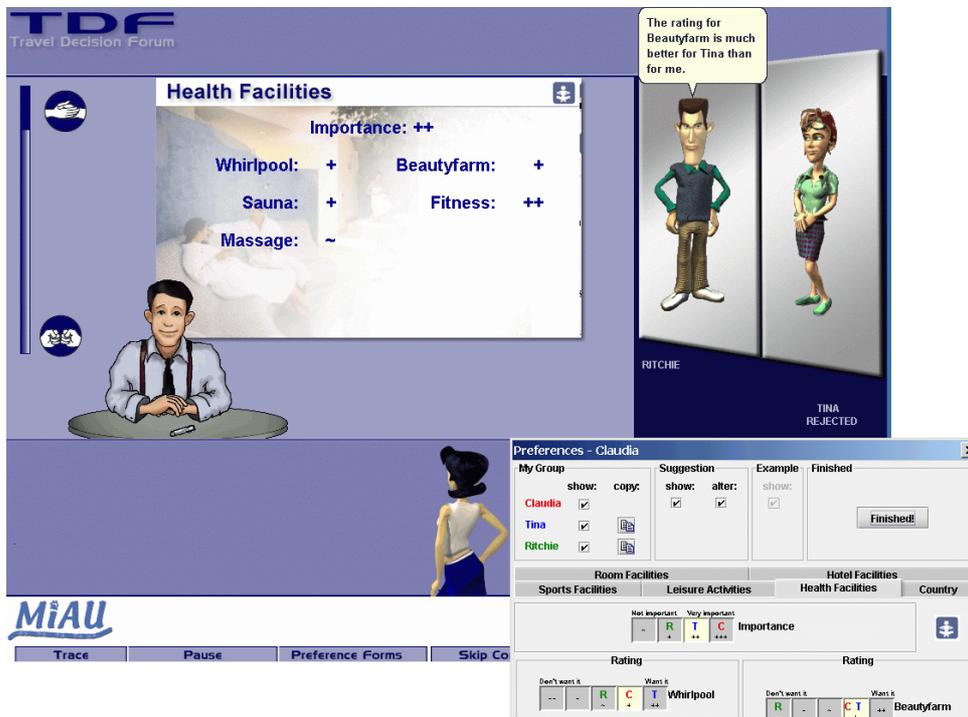
Figure 1. *Snapshot of an interaction in the Travel Decision Forum.*

(The proposal generated by the mediator (left) for the dimension Health Facilities *is shown on the screen, as well as in the preference form at the bottom right. The representative of Tina has already explained why the proposal is unacceptable to Tina. After the representative of Ritchie has finished commenting on the proposal, the current user, Claudia, will decide how to respond to to it.)*

2   Issues Raised by Representatives

This type of application scenario raises a number of general issues concerning dialog system design. In particular, it is not clear what the best approaches to the following two problems are, even though there exists a good deal of relevant previous research:

Avoiding monotony.   The comments of the representatives tend to be similar in form, since they all concern responses to proposals. But if the representatives' presentations are monotonous, the acceptance of the entire system is endangered. Possible partial solutions to this problem include (a) keeping utterances as short as possible after an initial period of familiarization; (b) introducing more or less random variation in the formulations; and (c) generating utterances that refer back to previous utterances (e.g. "I feel the same way as Tina does, except that . . . ").

Handling conflicts between actual and ostensible values of dialog parameters.   The presentation of insincere arguments raises interesting challenges for natural language generation on the pragmatic level. For example, what should a representative say if the current proposal is clearly acceptable according to its ostensible motivation but unacceptable according to its real motivation? Should the representative accept such an undesirable proposal simply in order to stay consistent with its ostensible motivation?

References

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