USING PROCESS KNOWLEDGE IN UNDERSTANDING TASK-ORIENTED DIALOGS

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This note outlines research on natural language communication between two parties cooperating to accomplish a task.♦ Our goal is to formalize the knowledge needed to understand task-oriented dialogs and to develop techniques for representing and coordinating this knowledge in a computer system that can participate in the dialog. Encoding general process knowledge and the dynamics of specific tasks in a manner that is useful for the interpretation and generation of utterances in a dialog is a central issue in this research.

A task orientation provides a framework for studying the influence of context on language. Our previous analyses of several task-oriented dialogs (e.g., Deutsch, 1974 indicate

> (1) The context of an utterance includes at least three discernable factors: the preceding utterances in the dialog, the state of the task, and the physical environment of the dialog.
>
> (2) Task-oriented dialogs have a structure that reflects the structure of the task.

The set of objects and actions that are most relevant to the conversation, and hence in the focus of attention of the dialog participants, changes as the task progresses. To follow such shifts in focus, a computational system needs a model of the task being performed.

To meet this need, we have developed a representation scheme for encoding process knowledge and are using it to encode data about specific tasks. This scheme is used both to answer particular questions about the task and to guide linguistic processing. The representation combines features of the partitioned semantic networks of Hendrix (1975), the procedural networks of Sacerdoti (1975), and the focus (i.e., context) mechanisms of Grosz (1977a, 1977b). Of particular interest is the fact that those objects that are in focus at a given time are clearly delineated.

We are currently developing algorithms that use this representation of task knowledge to expand the use of context in the interpretation of inputs and the generation of responses, instructions, and requests. These algorithms include mechanisms that follow the shift of focus with the progress of the task.

♦This work is supported by National Science Foundation Grant No. MCS76-22004

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