Natural language interfaces

“Natural Language Interfaces” (E. Rich, September Computer, pp. 39-47) was a useful introductory survey of the subject. However, the article gave several false impressions regarding our work at Texas Instruments on “menu-based natural language” interfaces.

First, NLX is a TI internal name. Naturalink is the commercial name. We have published a number of articles on the menu-based approach, but Rich’s article does not include any references to this work.

Second, the example on p. 44 fails to show the screen partitioned into menus, does not distinguish active and inactive menus, and does not show a query in progress. The textual explanation does not make it clear that the user builds up a question by choosing words and phrases from active menus, nor that the screen and the “Query So Far” are updated automatically.

Third, the menu-based approach can be used independently of the control structure that drives the menu displays, so a semantic grammar or a syntactic grammar can be used. Currently, semantic grammars are used. But, in the important special case of database interfaces, a syntactic grammar can be combined with domain-specific constraints to automatically generate semantic grammars from syntactic grammars in a compile-time step. We are currently looking at lexical-functional grammar or attributed-grammar formalisms as a way of parsing with a syntactic grammar while still satisfying domain constraints.

Fourth, the main bounds determining the complexity of the domain that a menu-based interface can handle are tied up in the “big menu” problem—there may be too many menu items to consider at a given moment. For practical purposes, we have been able to build interfaces on the Lisp machine to as complicated a domain as the Ladder blue file (14 tables and 72 attributes). Most research NLIs have involved much simpler domains. Rich’s article gives the impression that a menu-based approach is only applicable for asking simple questions in simple domains and that, for complex domains with complicated questions, a conventional NLI may be preferable. In theory, this may be true, since the big menu problem may eventually cause other problems. In practice, however, work on evaluation of conventional NLIs indicates that users tend to ask simple questions (about seven words long) partly because longer sentences have lower probability of staying within the lexical, grammatical, and conceptual bounds of the system. The menu-based approach avoids this problem, and users routinely ask complicated questions.

Fifth, we have reported on our progress in making menu-based interfaces portable to new database applications. Unlike conventional portable systems, automatically-generated, menu-based interfaces are immediately usable without an expensive empirical tuning phase. The statement on page 39 fails to make the reader aware of work on transportable NLIs. (A workshop addressing this area was held at Duke University on October 22-23, 1984). At present, the menu-based approach is in its infancy. Already, it is clear that, as an interface technology, the menu-based approach merits serious consideration. I hope that clarifying these points will aid the reader in understanding the approach.

References


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Korean Tung-po verse anthology

The Koreans developed printing by movable type five centuries before Johannes Gutenberg first reproduced the Bible on his printing press. The page from the Tung-po anthology pictured opposite the guest editor’s introduction (p.10) shows Korean movable type developed in response to a royal decree of 1434. The bronze cast type is in the Ming calligraphy style that the Koreans copied from the Chinese. The text is from the personal collection of Xerox vice president Paul A. Strassman, a Computer Society member, and is reproduced with his permission.