Future Plans

Areas for further improvement include allowing for more complex sentence constructions, a richer vocabulary, and making use of discourse information. In addition, we have recently begun a collaboration with a Semantic Compaction and Prentke Romich to transfer this technology into a "scaled-down" system.

Recent Publications Resulting from This Research

Applying Natural Language Processing Techniques to Augmentative Communication Systems. McCoy K et al., in Proceedings of the 13th International Conference on Computational Linguistics, Helsinki, Finland, 413-415, 1990

A Domain Independent Semantic Parser for Compansion. McCoy K et al., in Proceedings of the 13th Annual RESNA Conference, Washington, DC, 187-188, 1990.

Rate Enhancement Through Sentence Compansion

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Purpose

The goal of this project is to increase the communication rate of physically disabled individuals via natural language processing techniques. We wish to take as input a compressed message (i.e., uninflected content words) from the disabled individual, and yet pass a syntactically and semantically well-formed utterance to a speech synthesizer or text preparation system. At the same time, we wish to do this by placing as little a burden on the user as possible. Thus, we are not interested in a simple coding system where sentences have been stored and are indexed by their content words.

Progress

The present system has a vocabulary of over 400 words. It handles most tenses, produces a variety of sentence constructions, and has the capability to infer the verb or subject in some situations.

Methodology

Input to our system are the uninflected content words of an utterance; thus, many function words such as determiners (e.g., the, a) and prepositions (e.g., of, in) will be left out. The system is responsible for filling in missing words as well as correctly conjugating the verb and forming a syntactically correct utterance. We attempt to form an utterance whose word order most closely reflects the word order given in the original input the user wishes to convey. For example, if the system is given "APPLE EAT JOHN," we would like the system to produce the sentence, "THE APPLE IS EATEN BY JOHN." In order for the system to generate a well-formed utterance, it employs a semantic parser to form a semantic representation of the input words. In this example, the parser recognizes that EAT can be a verb which accepts an animate ACTOR and an inanimate/ food OBJECT in order to correctly infer the semantic relationships between these input words. The resulting semantic representation (along with a specification of the original word order) is then passed to the translation component which is responsible for replacing the semantic terms with their language-specific instantiations. The final phase of the processing is a sentence generator which attempts to form a syntactically correct sentence that retains the general order of the original input words.