

**Automated vocabulary collection to allow topical conversation for non-speaking people.**

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The Augmentative and Alternative Communication (AAC) research field is concerned with assisted communication for people that have complex communication needs. For users of AAC devices featuring pre-stored utterances, selecting the appropriate vocabulary is important. Their selected vocabulary set has to allow them to maintain successful conversations with speaking partners. The aim of the research is to automate the process of populating the AAC device user's vocabulary set with topical utterances created from information available on the web.

Conversation can be characterised into two main areas: transactional and interactional. Transactional interaction refers to communication that is “needs and wants” driven. Interactional conversation is characterised by phatic communication such as “hello” and “goodbye”, and free narrative such as storytelling (Cheepen, 1998). The use of interactional conversation allows us to develop relationships and define who we are in relation to other people. Conversation can also be defined as: predictable, reusable and unique. Predictable conversation includes speech acts such as openings, smalltalk, feedback and closings (Alm, 1988). Smalltalk usually consists of short, predictable topics such as the weather. Much of conversation, however, is characterised by topic based material, e.g. talking about one's interests, be it sports team or television programme.

It is difficult for users of AAC devices containing pre-stored phrases to talk about current issues such as a sports match as it happens or the latest news. They often need to wait until they or their carer has an opportunity to add new utterances to their communication aid. This means their conversation is limited to the utterances stored within them and usually restricted to “dated” topics. This paper reports on research which explores using natural language processing to automate the creation of utterances.

With the ever increasing size of the World Wide Web and the increasing amount of information available to the user, it seems logical that this information should be utilised. Work is being done in the fields of Information Retrieval and Natural Language Processing in making this information freely available to ordinary people, yet little is being done to provide this information to extra-ordinary users some of whom use AAC devices (Baeza-Yates & Ribeiro-Neto, 1999). The research reported here attempts to address this limitation by using the web as a large database from which current up-to-date information can be used to create utterances for the AAC user to use in communication.

A recent research project within the University of Dundee's Department of Applied Computing developed ICU-Talk, a communication aid for use by patients in hospital Intensive Care Units (ICU) (MacAulay et al, 2002). These patients are often temporarily unable to speak due to intubation, i.e. a tube in their throat separating their vocal chords from the air that would normally flow between them to facilitate speech. The ICU-Talk database contains phrases that are pre-stored, some from

observations of ICU patients attempting to communicate with nursing staff and some generated from the information provided via an interview tool; both sources provide a useful, yet restricted set of phrases. The phrases in the database for any particular patient are fixed; new phrases cannot be added later. This becomes increasingly significant as the patient's length of stay in ICU is prolonged and they want to talk about topics unrelated to their medical condition. These may include, for example, interest in the latest news, favourite television programme or a sports team. To address this, research was undertaken to provide patients with a broader range of up-to-date phrases and a means to discuss current events taking place outside the hospital environment.

A tool has been developed which takes a list of the patient's interests, from the information entered via the interview tool, and searches the web for news articles that may be of interest to the patient. Once an article is found, a sentence, or numbers of sentences, containing the essence of the text are identified. These sentences then form the basis of new phrases generated and are included within a database of potential utterances.

This paper will present the answers to the research question: Does access to topical utterances improve the quality of communication between an AAC user and a speaking partner? Users of communication aids featuring pre-stored utterances are provided with access to two aids; one containing the enhancements and one without. A scenario is then acted out by the users and observers are asked to rate the quality of the conversations.

ICU-Talk is just one application of this facility to capture potential utterances from news articles. This facility can be incorporated into any AAC device. Having the vocabulary updated automatically allows the AAC device user to regain control of the conversation. They are able to initiate and maintain conversations with their carers, who will now no longer be required to enter the utterances and listening to them being repeated during a conversation.

References:

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