

THE ROLE OF SPEECH IN THE USER INTERFACE

-Perspective and Application-

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ABSTRACT

Consideration must be given to the implication of speech as a communication medium before deciding to use speech input or output in an interactive environment. There are several effective control strategies for improving the quality of speech. The utility of the speech has been demonstrated by application to several illustrative problems where their application has proved effective despite all the limitation of synthetic speech output and automatic speech recognition systems.

1. A BIT ABOUT SPEECH

Speech is a man-made medium for communication of thoughts and ideas from one human to another rather than just a passive illumination of some aspect of the physical world. Speech may be arbitrary segmented into elements called phonemes, each with a characteristics spectrum and level although one phoneme blends into another. Phonemes are the smallest element of speech sound that indicates a difference in the spoken words of a language.

Our desires and needs are communicated to one another. Our ability to communicate via a medium of expression hereby called language is one of the most useful things we know how to do. A description of speech in terms of its spectral components or basic speech segments is a valid exercise to obtain some understanding of human speech, however, it does not illustrate the nuances of speech which combine to convey a large amount of information in the speech signal. The dreams of having communication between man and machine by speech has long fascinated scientist and engineers. Speech technology enables us to talk to our machines and for the machine to respond to us with real communication taken place.

2. CHALLENGES

The challenges that currently face the field of speech processing are many and varied. The obstructive nature of speech is one of the problems central to this field. While it is possible to ignore an image or picture which is not

desired to be seen, the avoidance of the sound from a speech is not possible and obstructive sound is rather difficult, if not impossible to ignore.

The continuous nature of speech signals vis highly variability, ambiguity, complexity and contamination of the signals is the first of the problems, that manifest themselves as a number of key problem areas which must be overcome. The problems of speech continuity, complexity, variability, ambiguity and contamination coupled with algorithmic difficulties therefore must be taken care of if speech processing is to be a reality. However, it should be noted that speech is not a blank monotone; with the effect that all voices vary in quality, physical features, the emphasis and the stress of a word, and many other reasons.

Furthermore, there is infinite variety between people both psychologically and physically. Intellectual processing power, memory and perception of humans vary considerably so also the physical factors of speech and hearing varies considerably from one person to another and even with the same person from time to time. Speech, music, codes, and even images can be converted to strings of number containing a given quantity of information to be distinguished and extracted from noise.

3. APPLICATION REQUIREMENTS / POTENTIAL APPLICATIONS

Speech can be used to know individual, since speech as a model has several and different components. Different talkers speak somewhat differently, and they sound different. Over the years -thousands- speech has been a fundamental/basic means of providing information, instruction and amusement to people and it is just natural that speech should be used as an output from information technology machines. It is imperative that speech interaction might come into its own in cases of high workload or concurrent tasking when additional sensory or motor channels usage becomes very important.

A question related to the use of speech in human-computer communication is voice identification. A computer that respond to spoken commands is well advised to be able to distinguish voices of those speakers who are authorized to use it from others. This aspect is also of much interest to Police agencies, who are frequently involved in criminal cases where it is vital to establish, in court, the identity of a recorded voice. Another example is the electronic book where traditional books are automated with voice replacing or augmenting text and diagrams, or pictures being the focus of attention. Also, speech input/output are finding wide applications in security/validation, language translation, teaching aids, telephone doctor, cartography, inventory checking, aids for disabled, industrial robots, air traffic control and several

others. A powerful feature in many work situations is the ability to add voice annotation to a document.

4. EVALUATION / CONCLUSION

A computer can derive its personality from the speech output and this can also generate attitudes and expectation on the part of the user. The potential benefits of speech are that they reduce the mental and physical load and can, in the right circumstances produce a faster interaction and can be more efficient in hand-and-eye busy environment. Consideration should be given to the tasks to be performed and whether speech will help this when speech is being considered for input applications.

Ultimately the test of any product is whether it is effective, and usually this means whether it is popular. In any case, if these machines/system are not readily accessible and easy to use, computer with enhanced intelligence could well become objects of suspicion and fear or they could simply be ignored by large potential users.

5. BIBLIOGRAPHY

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