

XXX. SPEECH COMMUNICATION*

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RESEARCH OBJECTIVES

The broad aim of our research in speech communication is to gain an understanding of the nature of the processes of human speech production and perception. A practical goal is to utilize knowledge gained through study of these processes to devise procedures that will permit limited communication between men and machines by means of speech. Several projects directed toward these goals are active, at present. The system of distinctive features underlying speech events is being re-examined with the use of data from acoustic analysis of speech events and from studies of speech perception. This work is leading to a more sound basis for the feature system, and serves to suggest certain modifications of that system. New methods of speech analysis, based on the theory of homomorphic systems, are being applied to the examination of the acoustic properties of speech sounds. We are continuing the development of procedures for speech synthesis, using a dynamic articulatory model of tongue, jaw, and lip movements and a terminal analog of the vocal tract. Studies of the production and perception of speech sounds by children, by using spectrographic techniques and tests involving the responses of children to natural and synthetic speech stimuli, are providing some insights into the process whereby language is acquired. Current work on the problem of automatic speech recognition is directed toward finding procedures for extracting attributes of an utterance, and for using these attributes to provide a partial indication of entries in the matrix of features which underlies the utterance. In much of the research in speech communication we shall utilize a computer facility centered on a medium-sized digital computer that has recently been acquired. Some of the activities of our group during the forthcoming year will be concerned with development of hardware and software systems for use in examining experimental data on speech, for the simulation of various aspects of the speech process, and for the generation of stimuli to be used in studies of speech perception.

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