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A SPEECH PROCESSING STRATEGY FOR AN ELECTRO-TACTILE VOCODER

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Past attempts at using the skin for recognition of tactile patterns derived from acoustic speech signals have largely been unsuccessful for perception of running speech. Problems facing researchers in this field include: frequency discrimination, especially for electrical stimulation, temporal and spatial resolution, real time speech processing and tactile pattern configuration strategies. It is considered that recent developments in speech processing which allow real time estimation of formant frequencies and vocal tract area functions will enable a successful speech aid to be developed. Based on results of the Tadoma (or Hofgaard) Method, in which speech is perceived by the deaf-blind using tactile and kinesthetic senses to determine movements of a speaker's articulators, a model is evaluated which enables a tactile display of articulatory information derived from parameters extracted from the speech signal by real time speech processing. Psychophysical measurements of percepts of computer derived patterns were carried out concentrating in particular on patterns more likely to be important for phonemic and speech discrimination. In this way it is hoped to validate the model as a useful speech aid for the profoundly and partially deaf.

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