

PHONETIC MODELING - THEORY AND APPLICATION

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Some of the most important goals of phonetic research should be (a) to explain the universal principles of speech processes, (b) to describe the language specific solutions thereof, (c) to build machines that help man to communicate with other machines or via machines with other people. This work can only partly be done by describing phenomena. The main tool seems to be the use of explicitly defined models which can be implemented on computers in order to test hypotheses.

A phonetic model of speech communication should be differentiated within two planes: (1) along a horizontal axis from speaking to hearing, and (2) by different vertical levels of phonetic and linguistic information. Concerning the first plane the model should consist of the following main parts which are interrelated with each other: (1) a parametric acoustico-genetic synthesizer, (2) an acoustic analyzer with parameter extraction, (3) a phonetic processor for the control of synthesis, analysis and recognition. Some of the main problems to be solved are: coarticulation, assimilation and compensation in synthesis, extraction of articulatory parameters in acoustic analysis, segmentation and classification in recognition. While the acoustico-genetic synthesizer simulated on a computer already works, we hope to present the results of combining synthesis with analysis. The control of an articulatory model by acoustic parameters and simulation of compensation should be possible.