

Kishore N. Takalikar, A speech training aid for the deaf, M. Tech. Thesis, Department of Electrical Engineering, Indian Institute of Technology Bombay, 1991.

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Abstract - Profoundly deaf persons face difficulty in acquiring and producing proper articulation and prosodic features of speech due to lack of auditory feedback. This project is aimed at developing a speech training aid for the deaf which will display a realistic vocal tract shape, pitch, and energy corresponding to the input speech waveform, with the objective of providing feedback for learning place of articulation, intonation, stress, and rhythm.

In the first stage of aid development, processing of speech waveform and display for visual feedback were carried out in off-line mode on a PC> A realistic vocal tract shape is estimated from the reflection coefficients obtained from linear predictive coding, and energy and pitch values are estimated from the autocorrelation analysis of short segments of the discretized input. Vocal tract shape, energy, and pitch for the selected segment are simultaneously displayed on the PC screen.

Finally, a system for real-time analysis of speech signal and display was implemented by using a PC, a DSP TMS-32010 Evaluation Module (EVM) from Texas Instruments and extension and interface hardware developed in an earlier project. Using this system, estimates of realistic vocal tract shape and energy values for the selected short segments from a speech signal of up to one second duration can be displayed.