

ABSTRACT

Adaptive Differential Pulse Code Modulation (ADPCM) is one of some widely used compression techniques for speech signal. ADPCM can bring better coding quality rather than Pulse Code Modulation (PCM) technique (equal output quality, but with fewer bits). In ADPCM process, the speech signal is quantized by PCM technique, then processed by ADPCM encoding algorithm (two-steps, PCM-ADPCM). This research tries to find better quality of ADPCM output, by adding 2nd-level ADPCM process to the conventional ADPCM algorithm, making it into two-level ADPCM (three-steps, PCM-ADPCM-ADPCM).

This research simulates the encoding-decoding process of conventional ADPCM system (PCM-ADPCM) and two-level ADPCM system, using various combinations of bit length / bit rate on 1st-level and 2nd-level ADPCM, with the encoded 8-bits-PCM speech signals for the simulation input. The simulation outputs for each combination are then analyzed, to observe signal-to-quantization-distortion performance (signal quality), by Mean Opinion Score (MOS) subjective test, and by calculating the Mean Square Error (MSE) as the objective method. The quality results are then compared one to another.

The analysis results of this research show quality improvement of the reconstructed speech signal of the two-level ADPCM rather than the conventional ADPCM. However, the outputs of two-level ADPCM suffer from bit error.

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