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University College Sedaya International

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UNIVERSITY

SCHOOL OF ENGINEERING

FINAL REPORT

SPEECH QUALITY ENHANCEMENT
USING TI TMS320C5x

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JANUARY – AUGUST 2005

Abstract

Speech sounds occupy 8 kHz or more bandwidth. However, speech is transmitted practically in narrowband of bandwidth range between 300 Hz to 3400 Hz, in most of the communication systems. The resulting speech quality always characterized by thin and muffled sounds, and degraded speaker identification, which is called as telephone quality speech.

Telephone quality speech can be enhanced by using many different method, such as simple aliasing, echo cancellation and noise reduction method. However, speech bandwidth expansion is the most common method used in communication system.

This thesis describes the bandwidth extrapolation speech quality enhancement algorithm, which is based on the codebook mapping. This objective of this algorithm is to extend the narrowband signal from 8 kHz to 16 kHz, in order to improve the speech quality. The algorithm is based on the single dual codebooks mapping to recover the missing high-band spectrum. Besides, the methods for speech quality evaluation also had been studied and described in this thesis.

After the development of the algorithm, the quality of the generated speech was evaluated by subjective and objective listening tests. The listening tests results show that the algorithm is inefficient in some situations and some future improvements are needed.