BANDWIDTH EXTENSION OF TELEPHONE SPEECH USING FRAME−BASED EXCITATION AND ROBUST FEATURES (ThuAmPO4)

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Abstract :

The standards that are still in use for telephone communications since the 1950s limit the information bandwidth to 300−3400Hz. However, in normal conversational speech, the frequency content is mainly between 0−8000Hz. This constraint degrades not only the sound quality but also the intelligibility of the transmitted signal. Instead of modifying the present telecommunication infrastructures, which would cost billions of dollars, many researchers have been studying more efficient methods to increase the quality of telephone speech. This paper develops an innovative solution to bandwidth extension, which is based upon the Linear Source Filter Model that breaks speech up into two parts: the excitation and the spectral envelope. Novel approaches are used to extend the frequency information for both parts. This algorithm particularly emphasizes low frequency reconstruction without neglecting high frequencies. Furthermore, different feature sets to model the spectral envelope are employed for better performance under noisy conditions.

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