URN etd-0407109-183703-141
Author Yi-Yan Fang
Author's Email Address No Public.
Statistics This thesis had been viewed 62 times. Download 25 times.
Department
Year 2006
Semester 2
Degree Master
Type of Document Master's Thesis
Language zh-TW.Big5 Chinese
Title A Variable Speed Playback System of Audio using the Low Complexity Algorithm
Date of Defense 0000-00-00
Page Count 75
Keyword
Time scale modification (TSM)
Synchronized OLA (SOLA)
waveform similarity Overlap and Add (WSOLA)
Mean Opinion Score (MOS)
Signal-to-Noise Ratio (SNR)
Spectral Distance (SD)
Perceptual weighting

Abstract
Time scale modification (TSM) is able to change the speech speed with the same pitch (the speaker's tone) in playback. In this paper, we proposed a simple TSM approach, called the low complexity TSM (L-TSM), to reduce the computational complexity of SOLA [Roucos 1985] and WSOLA [Verhelst 1993]. The proposed L-TSM approach can reduce about 80% computational load for SOLA and WSOLA with perceptually intangible degradation in performance. In addition, we also proposed another approach, called the Gradual WSOLA (G-WSOLA) algorithm to further reduce the complexity of WSOLA one. Besides, to evaluate the quality of two modified speeches, it is well known that the Mean Opinion Score (MOS) is the best subjective measurement as well as the spectrogram is the best objective one. However, they are difficult to receive the official confirm. In this paper, we propose a novel measure, called Spectrum Similarity Curve (SSC). The proposed SSC can objectively evaluate the quality of TSM-modified speech comparing with the original speech along the time axis. Furthermore, the Perceptually Weighted Curve of Spectrum Similarity (PWCSS) has been proposed to evaluate the quality of TSM-modified speech with more close to human perception. The results of proposed SSC methods can compare the quality of TSM-modified speech for different TSM algorithms. They also match the result of MOS results. Applying the PWCSS measurement, we can show the degradation of performance for the proposed two simplified TSM approaches, L-TSM and G-WSOLA algorithms. Finally, a software implementation for the mentioned TSM approaches will be achieved with windows programming.
Advisory Committee Fu Kun Chen - advisor

Files etd-0407109-183703-141-001.pdf

indicate access worldwide
Date of Submission 2007-07-27