Abstract

In this paper short-time homomorphic analysis, the harmonic representation of speech, and the spectral smoothing interpretation of homomorphic deconvolution are explored, resulting in adaptive time-domain windowing and log-magnitude smoothing techniques for improved spectral estimates and enhanced quality of a minimum phase homomorphic vocoder. With an adaptive window alignment scheme a slowly varying (over successive frames) mixed-phase impulse-response estimate is introduced through the complex cepstrum, yielding somewhat higher quality speech than its minimum phase counterpart. For a cepstral window of unity and exact pitch knowledge, this analysis-synthesis scheme acts as an identity system on stationary periodic waveforms.

In addition, results of coding the smooth log-magnitude and a comparative study of conventional and sliding chirp-z transform implementation schemes are briefly presented.