

Low-Complexity Wideband LSF Quantization Using Algebraic Trellis VQ

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Abstract: In this paper an algebraic trellis vector quantization (ATVQ) that introduces algebraic codebooks into trellis coded vector quantization (TCVQ) structure is presented. Low encoding complexity and minimum memory storage requirements are achieved using the proposed approach. It exploits advantages of both the TCVQ and the algebraic codebooks to know the delayed decision, the codebook widening, the low computational complexity and the no storage of the codebook. This novel vector quantization scheme is used to encode the wideband speech line spectral frequencies (LSF) parameters. Experimental results on wideband speech have shown that ATVQ yields the same performance as the traditional split vector quantization (SVQ) and the TCVQ in terms of spectral distortion (SD). It can achieve a transparent quality at 47bits/frame with a considerable reduction of memory storage and computation complexity when compared to SVQ and TCVQ.

Keywords : trellis coded quantization, algebraic codebook, LSF, wideband speech coding