COMPANDED LATTICE VQ FOR EFFICIENT PARAMETRIC LPC QUANTIZATION (ThuPmPO1)

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**Abstract:**
Source coding based on Gaussian Mixture Models (GMM) has been recently proposed for LPC quantization. We address in this paper the related problem of designing efficient codebooks for Gaussian vector sources. A new technique of ellipsoidal lattice vector quantization (VQ) is described, based on 1) scalar companding optimized for Gaussian random variables and 2) rectangular lattice codebooks with fast trellis–based nearest neighbor search. The Barnes–Wall lattice L16 in dimension 16 is applied to quantize the line spectrum frequencies (LSF) of wideband speech signals. The LSF are computed in a manner similar to the AMR–WB speech coding algorithm. The performance of memoryless and predictive LSF quantization for different GMM orders (4, 8 and 16) is evaluated at 36 and 46 bits per frame. The companded lattice VQ is shown to perform better than its scalar counterpart, with similar complexity.