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A New Multistage Search of Algebraic CELP Codebooks Based on Trellis Coding

M. Halimi, A. Kaddaï, M. Bengherabi

Abstract: This paper proposes a new multistage technique of algebraic codebook in CELP coders called Trellis Search inspired from the Trellis Coded Quantization (TCQ). This search technique is implemented into the fixed codebook of the standard G.729 for objective evaluation on a large corpus of a testing speech database. Simulation results show that in terms of computer execution time the proposed search scheme reduces the codebook search by approximately 23% compared to the time of focused search used in the standard G.729. This yields to a reduction of about 8% in the computer execution time of the coder at the cost of a slight degradation of speech quality but perceptually not noticeable. Moreover, this new techniques shows better speech quality than the G.729A at the expense of a higher complexity.

Keywords : Trellis, algebraic codebook, speech coding, CELP, G729