Transactions on Systems, Signals & Devices

Volume 1, Issue 3, 2006, Pages 235-244

Low-delay 16 kb/s Wideband Speech Coder with Fast Search Methods

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Abstract: In this paper, a low delay 16kb/s wideband speech coder with a buffering delay of 1.25ms is introduced. This coder is basically inspired from the G728 LD-CELP standard for narrowband speech signals. Our main goal is to reduce the implementation complexity of our wideband G728 –like- coder, which is mainly due to the search of the optimal excitation (gain-shape) in codebook. For this reason an algebraic codebook is proposed and an exhaustive optimal search and suboptimal full position and Joint Position and Amplitude search techniques are implemented. Objective performance evaluation on a large corpus of a testing speech database show that the JAPS (Joint Position and Amplitude Search) multistage search technique proposed recently can yield to a very important reduction of coder computational load, with only a slight degradation in the quality of synthesized speech signals compared to other -high complexity- search techniques.

Keywords : - Low delay CELP, G728, Backward LPC analysis, algebraic codebook