论文

一种可用于CDMA移动通信的变速率语音编码算法

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摘要
该文提出了一种码率为 0.75-5.4kb/s可变速率的高质量语音编码讲法。该算法对CELP的激励进行了改进,根据语音的特征把语音分成4类, 不同类型的语音采用不同的激励码本。特别是对于浊音, 提出了一种基于基音同步的嵌入分裂式激励码本, 该码本利用浊音具有准周期性的特点, 使该算法在很低的码率下就可很好地恢复浊音信号, 克服了CELP在4kb/s速率以下因码本尺寸小而导致合成语音质量差的缺点。经非正式听音测试, 它的主观质量超过了1~8kb/s的可变速率QCELP系统, 并且平均速率大约只有2kb/s, 比QCELP的5kb/s平均速率低了很多、非常适用于 CDMA移动通信系统。

关键词　　语音编码　 变速率　 矢量量化　 基音周期

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A variable rate speech coding algorithm for CDMA mobile communications

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Abstract
This paper focuses on the design of high quality speech coding with variable rate at 0.75~5.4kb/s. The new algorithm classifies input speech signals as noise, unvoiced speech, transitional speech and voiced speech, and it uses different codebooks as excited impulses according to different types of speech frames. Especially, an embedded splitting vector quantization method based on pitch synchronization to synthesize voiced speech is proposed. The speech can be recovered very well at low bit rate by making use of the itch periodicity for voiced speech frames. This new algorithm can overcome the disadvantage of CELP whose recovered speech quality will degrade quickly when the bit rate is below 4kb/s because the codebook size is too small. the informal listeing test results show that the subject quality of the algorithm exceeds that of QCELP while the average bit rate of the algorithm is only about 2kb/s, which is much lower than that of QCELP whose average bit rate is about 5kb/s. This new speech coding algorithm is therefore very apt to CDMA mobile communication systems.

Key words　 Speech coding　 Variable rate. Vector quantization. Pitch

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