信号处理 2011, 27(4) 514-521 DOI: ISSN: 1003-0530 CN: 11-2406/TN

论文与技术报告

低复杂度的可伸缩视频流媒体MGS编码方案优化

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摘要：

针对不同带宽环境及用户分布选取可伸缩视频流媒体编码方案的不确定性问题是影响视频流编码质量的关键因素，为了实现在指定网络带宽区域条件下多用户实时性访问的编码质量优化，提出了一种低复杂度适应网络带宽区域和质量可伸缩的视频流媒体编码方案优化方法。该方法的基本思想是在视频内容分析和理解的基础上，首先根据MGS片层数据统计特性设计出对应率失真(R-D)模型，结合I,P,B帧类型率失真特性进行视频流码率估计;然后根据优化算法推导出合理编码方式;最后分析该方法的计算时间复杂度。在ITU-T标准文档Q.6/SG16所定义的信道通用测试平台上进行实验研究,实验结果表明所提优化方法能在与传统编码方案复杂度近似情况下带来0.3-1dB视频序列质量增益，且适用于通用的传输信道模型。

关键词： 视频流媒体； 质量增强层； 率失真；通用测试平台

MGS Encoding Scheme Optimization of Scalable Video Streaming Media with Low Complexity

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Abstract:

Aiming at different bandwidth and user distribution, the choice of scalable video streaming media encoding scheme is a uncertain problem in encoding quality. In order to realize encoding quality under certain network bandwidth range and multi-user real-time access, a new approach to encoding scheme optimization of VSM adapted to network bandwidth and quality scalability with low complexity is proposed. On the basis of video content analysis and comprehension, according to statistical characteristics of MGS quality increments, corresponded R-D model is designed. Combined with I,P,B frames rate-distortion characteristics, video bit rate can be estimated firstly. Secondly combined with optimization algorithm, more reasonable SVC encoding scheme can be deduced. Finally, computational time complexity of the method is analyzed. Experimental study is performed on channel common testing platform defined by ITU-T Q.6/SG16 document, experimental results show that the approach to encoding optimization of VSM proposed in this paper can bring 0.3-1dB more gain than usual method and suitable for common transmission channel when it has similar time complexity as usual method.

Keywords: video streaming media(VSM) quality increment rate distortion;common testing platform

收稿日期 2010-11-19 修回日期 2010-12-30 网络版发布日期 2011-04-25

DOI:

基金项目:

国家自然科学基金资助项目(60772163)；广东产学研基金资助项目(2009B090300355)

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