基于有效期望质量度量的图像混合丢包保护方法

杨亚东,吴成柯,肖嵩

(1) 西安电子科技大学 综合业务网理论与关键技术国家重点实验室，陕西 西安 710071
(2) 空军工程大学 电讯工程学院，陕西 西安 710077

摘要　　针对现有基于交织器结构的不等丢包保护方案通常以端到端期望质量度量系统性能，而没有考虑最小质量要求的问题，提出了以有效期望质量度量系统性能的新判据. 有效期望质量定义为扣除传输失败情况后接收端得到的期望质量. 基于此新判据，提出了一种双向局部搜索的信源/信道码率分配算法. 采用双状态马尔可夫网络模型，通过对SPIHT和JPEG2000编码器产生的码流数据进行仿真实验，结果表明，新算法与基于端到端期望质量度量的原算法相比能显著提高有效期望质量，降低传输失败事件发生的概率，同时计算复杂度也明显减小.

关键词　　图像传输　联合信源/信道编码　不等保护　QoS　JPEG2000

分类号　TN919.8

Hybrid loss protection method based on the measurement of the effective expected quality for image transmission

YANG Ya-dong(1,2),WU Cheng-ke(1), XIAO Song(1), DU Jian-chao(1)

(1) State Key Lab. of Integrated Service Networks, Xidian Univ., Xi′an 710071，　China;
(2) The Telecommunication Engineering Inst., AFEU., Xi′an 710077，　China

Abstract
The performance of the existing unequal loss protection system based on the interleaver structure is usually measured by the expected quality without considering the minimum quality requirement. In this paper, a new objective function named the effective expected quality is proposed, which is defined as the received expected quality excluding the contribution from failure transmission, i.e., the quality of the decoded image is below the minimum quality requirement. With this objective function, a new algorithm combining equal and unequal protection strategies based on bidirectional local search is presented to allocate the transmission bit budget between the source and the channel coders to maximize the effective expected quality. Experiments are carried out with the source coders of SPIHT and JPEG2000 and the network model of two-state Markov. Results show that the new algorithm can provide significantly higher effective expected quality and lower probability of failure transmision with lower computational complexity compared to the previous algorithm.

Key words　　image transmission　joint source/channel coding　unequal loss protection　quality of service(QoS)　JPEG2000

DOI:

通讯作者