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Title:	Proposal of solution for problems of Hybrid - Perceptual Bitstream Project		

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Summary

Now, in the hybrid perceptual / bitstream project, the VQEG is considering a new framework of an objective video-quality assessment method. In this contribution, we show potential tasks in the hybrid perceptual / bitstream project and propose solutions for those tasks.

1. Introduction

The demand for high-reliability, light-weight objective video quality assessment is increasing. Therefore, the result of the hybrid perceptual / bitstream project is urgently required for providing rapid standardization in the industry. However, there are specific problems caused by using bitstream information in the hybrid perceptual / bitstream project.

2. Discussion

Assumed problems and our proposed solutions are shown in the following paragraph.

A) Recommendations including results of hybrid perceptual / bitstream project

J.bitvqm is being studied in ITU-T SG9 to include the result of the hybrid perceptual/bitstream project. However, J.bitvqm is not an appropriate framework for the parametric bitstream (w/o PVS) model in the hybrid perceptual / bitstream project because the scope of J.bitvqm assumes to use both PVS and bitstream information. Moreover we guess that one of the purposes of P.NAMS (under consideration) will be to assess video quality for in-service quality monitoring by using parametric bitstream information without decoding. This is the main purpose

of parametric bitstream model. Therefore, we think the scope of J.bitvqm studied in ITU-T SG9 should include the perceptual / bitstream model (FR, RR, NR) and the scope of P.NAMS studied in ITU-T SG12 should include the parametric bitstream (w/o PVS) model. A detailed classification is shown in another contribution “Input parameters for P.NAMS”.

B) Input information of hybrid perceptual / bitstream model (Output information of bitstream analyzer)

Now, codec parameter, bit rate, FPS, packet information, location of impaired block, and some other parameters are assumed to be the output of a bitstream analyzer. However, on the current condition, the estimation accuracies of objective video quality assessments, especially the NR perceptual / bitstream model and parametric bitstream (w/o PVS) model, are not enough because these models cannot use the information of a source video. In principle, we can get syntax information in an elementary stream of a coded video sequence from a bitstream analyzer. That information has a strong correlation with the characteristics of a source video scene and will have a large influence on subjective video quality. Therefore, we recommend using syntax information included in an elementary stream as the input information of hybrid perceptual / bitstream model (output of a bitstream analyzer). This syntax information is defined in the standardized recommendation of a coding method. In the case of the parametric bitstream (w/o PVS) model, we have briefly studied about the relationship between some ES layer parameters and subjective video quality for H.264 coding distortion. We report this result in another contribution: “Performance of parametric bitstream model using ES layer information”.

3. Proposal

In this contribution, we proposed that the scope of P.NAMS studied in ITU-T SG12 should include the parametric bitstream (w/o PVS) model and syntax information included in an elementary stream should be used as the input information of hybrid perceptual / bitstream model (output of a bitstream analyzer).