Quantifying the Price of Video Quality

Master Thesis
Bachelor Thesis

TECHNISCHE UNIVERSITÄT DARMSTADT

Background

The visual cortex of the human brain can assess the perceived quality of a video sequence within split seconds. As this information is very valuable for video encoding and transmission schemes, Quality of Experience (QoE) models were developed. Based on these models, the QoE literature has identified two major groups of influence factors on the user perceived experience:

- Group 1: The frequency and length of stalling events (i.e., how often long does the playback freeze) [1]
- Group 2: The image quality (i.e., the resolution, blockiness, …) [2]

Currently, there are models relying on the first or second group of input parameters exclusively to estimate a video's QoE. However, this view on QoE is not exhaustive: usually, varying image quality and stalling happen within video sessions at the same time. Moreover, rising Video on Demand services such as Netflix often apply a pay per use model for the content, which can be assumed to be influential. A joint model taking all the discussed parameters into account would provide valuable insights for video distribution services.

In this thesis, we plan to create a holistic QoE model based on user studies. Therefore, the following steps are foreseen:

- Literature review of the related work
- Generation of test videos with differing quality settings
- User study: user study (choice-conjoint analysis) to determine weights of the discussed influence parameters and prices

If you are interested in video encoding, video quality assessment and pricing do not hesitate to contact one of the persons below.

[1] T. Hoßfeld, D. Strohmeier, A. Raake, & R. Schatz, "Pippi Longstocking Calculus for Temporal Stimuli Pattern on YouTube QoE". ACM MoVid, 2013.
[2] M. H. Pinson and S. Wolf, "A New Standardized Method for Objectively Measuring Video Quality," IEEE Trans. Broadcast., vol. 50, no. 3, pp. 312–322, 2004.

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-3 -2 -1 0 +1 +2 +3 (X at +1) Theoretical (Analytical)
-3 -2 -1 0 +1 +2 +3 (X at 0) Empirical (Simulation)
-3 -2 -1 0 +1 +2 +3 (X at +2) Practical (Implementation)
-3 -2 -1 0 +1 +2 +3 (X at -1) Literature

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