The large scale dataset
Packet loss simulations

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Context and Aim

- Joint work with
  - Glenn Van Wallendael
  - Marcus Barkowsky

- Large dataset of 59,520 HEVC-encoded video sequences (details in [1], already presented in previous meetings)
  - 5 metrics available: PSNR, SSIM, VIF, VQM, PVQM
  - Total video quality and frame-level granularity (for each one of the 250 frames)

- What is the effect of packet losses on the objective video quality?
Methodology

1. Simulate reasonable packet losses affecting the video sequences
   - Use of the publicly available HEVC robust decoder presented in previous meetings [2][3] to create PVS
     - Note: this decoder, by construction, does not cause temporal misalignment between the processed video sequence (PVS) and the original one (SRC)
   - Use of packet loss traces with reasonable parameters

2. Compute the objective quality measures:
   - PSNR, SSIM, VIF, VQM, PVQM

3. Identify interesting cases and unexpected behaviors to be investigated further
Parameters

- Loss traces (generated by Glenn) using a 2-state Markov model with good and bad state
  - Packet loss rate: 0.5% and 1%
  - Average burst length: 1, 1.5, 2
  - Total: 25 realization of the loss traces

- Each event affects one slice of the source sequence. Depending on the encoding parameters of the sequence, the affected area can be:
  - The whole frame
  - A slice with a fixed number of macroblocks
  - A slice with a maximum number of bytes
Current Status

- Not all combinations of resolution, coding parameters and losses have been covered yet due to complexity.
- A priority list has been decided (see wiki [4]):

  - **Priority**: Green: high   Silver: medium   Transparent: low
  - **Rationale**: try to cover extreme values first, then intermediate values especially w.r.t. rate.

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<th>Value 1</th>
<th>Value 2</th>
<th>Value 3</th>
<th>Value 4</th>
<th>Value 5</th>
<th>Value 6</th>
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Current Status and Conclusions

- Status:
  - Resolution 960x544
    - all 19,840 sequences have been subject to all loss traces
    - total 496,000 objective video quality values for each metric (PSNR, SSIM, VIF, VQM, PVQM) with frame-level granularity
  - Resolution 1280x720 and 1920x1080
    - All high-priority combinations tested until now
    - Total 22,500 combinations done, more on the way

- Freely available at [5][6] (links also on the wiki pages)
- We hope to investigate results soon to get a first idea of how the considered metrics react to losses
  - Anybody is welcome to join!
References


