Meeting Minutes VQEG, Rennes

**Date:** 2012-06-12, Afternoon Sessions

**Note Taker:** Christian Schmidmer

# MOAVI Project

Presentation by Emmanuel Wyckens regarding the goal of MOAVI:

* Maintain a list of real-world audio-visual monitoring applications
* Identify main indicators taken into account by customers when evaluating the quality of a service
* 3-point quality scale only (like a traffic light) shall be used
* Define and develop indicators prediction distortions on this three point scale
* Evaluate performance the indicators

Mikolaj Leszcuk: No progress since the last meeting has been made, but a very short position paper was sent to a conference. More progress is expected in the next few months.

A proposed project plan exists on google groups. (JEG-MOAVI Evaluation Project-Plan). The project plan mentions already some potential KPIs to be measured. Most of these are indicators which can be verbally described, like e.g. Freezing, Blur, Blockiness, but also Lip-Sync could be interesting. Effects like “Photosensitive Epilepsy” (ITU-R BT.1702) are also mentioned.

The project is targeting at NR-models only. The idea is to apply the model directly to e.g. the output of a set-top box.

Arthur Webster: Perhaps we should not limit the scope to NR right now since there seems demand from some cable companies that may want something else too.

Some discussion about the type of models started, but did not lead to a change of the goal of basing the work on NR models.

Kjell Brunnstrom sees an overlap between this project and JEG-Hybrid. Mikolaj doesn’t see this since we are talking about binary (or ternary) values and indicators only. KB points out that nevertheless the calculation of the indicators could be very similar (e.g. estimation of Blur).

The work is meant to be conducted in a collaborative approach.

Silvio Borer: The idea of collecting indicators instead of a MOS is to avoid issues where distortions are not picked up by a MOS measure.

## Presentation by Jens Berger on You Tube streaming:

* Impressive numbers on You Tube usage
* YT typically transcodes uploaded material to H.264 in different bitrates which are tied to each target screen resolution that ranges from 240p to 1080p.

* The timing of a typical YT session was shown on the slides. It becomes clear that the process is split into a part used for the session setup (showing the web page, starting the player, locating the stream etc.) and the actual streaming phase (buffering of the stream, display of the stream)
* Except for 3G applications HTTP/TCP is used for the download. Mobile applications use RTP.
* The question is raised if it makes sense to measure all YT timing KPIs for clips which are just 8s long. A typical YT clip would be between 90s and very few minutes, not 8s.
* Video distortions seen are caused by the original compression before uploading the video, YT transcoding, additional compression performed by the network during transmission and transmission problems.
* Important: If TCP is used, no packets get lost, but rebuffering may occur.
* Freezing duration means not much since it only depends on how much data the player is typically buffering (trade-off between initial buffering time and potential rebuffering)
* Today we are focused on short term Video Quality in terms of MOS and IP through put, but there is more to it….
* Longer evaluation time is required!
* Short term evaluation to measure compression quality in intervals
* Aggregation of data
* Combination with freezing
* Consideration of buffering time
* The result could be a “service quality indicator” plus additional indicators for certain quality dimensions.

Lucjan recommends two papers which are related to the presentation:

Those are titles of the talks about youtube.com. It was presented here:

<http://www.tma-portal.eu/cost-tma-action/meetings/lisbon/programme/>

Alessandro Finamore - YouTube Everywhere: Impact of Device and

Infrastructure Synergies on User Experience

Tobias Hossfeld - Modeling and Monitoring YouTube QoE

The question arises how the quality of a longer video shall be assessed subjectively.

Christian Schmidmer: Maybe it is not required to be very exact with the long-term estimate, and it is more important to provide more accurate statistics on shorter intervals which are hen aggregated to a coarse aggregated quality indicator.

Quan Huynh-Thu mentions that as opposed to Jens’ presentation, the original goal of MOAVI was more to specify distortion indicators rather than a MOS for a long sequence.

Mikolaj: Since we are not trying to combine indicators to a MOS, the work is much easier than predicting a MOS.

Arthur mentions that ITU-T P.930 (Principles for a Reference Impairment System for Video) recommends a method to insert well defined distortions (Blockiness, Blur, ?) into videos. This might be very interesting in order to generate test data for this project.

# HDR Imaging and Video Quality Project

## Introduction of the project by Patrick Le Callet:

What is HDR (High Dynamic Range)?

Human eyes can adjust to a range between 10e-6 to 10e6 cd/m2, but only five orders of magnitude at the same time. Current LCDs can display a range of …

Digital cameras have a dynamic range up to 2e5 to 2e9 with a resolution of 14 bits.

To achieve a higher dynamic range in digital images/videos, over and under exposed versions of the same image can be combined. This results in images with more detail in the very dark and very bright areas. For still images this is easy to achieve, for video, special rigs with multiple cameras are used.

Displays: Only one HDR display is currently sold.

Tone Mapping: Convert the high dynamic range back to a range which can be presented on a Low Dynamic Range (LDR) screen.

* Simple contrast reduction is not sufficient!

Inverse Tone Mapping: Convert an LDR video for presentation on an HDR screen

Problems:

* Almost no native HDR capturing device exists
* Combining LDR images to an HDR image causes defects:
  + Ghosting
  + Alignment / geometric distortions
  + Lens flare problems between cameras
  + Noise due to large differences
* Display:
  + Much higher luminance than usual
  + Need for normalized experiment rooms
  + HDR displays are not easy to feed
  + Almost no HDR player is available
  + Displays are not widely available
  + Using an LDR display requires tone mapping
* How many bits are required for viewing HDR images
* Need for a high bit-depth codec
* Which transport strategy to use?
  + Single HDR channel or multiple LDR channels?

HDR displayed on HDR display:

* Better immersion?
* More natural images?
* More emotions?
* Visual fatigue due to high luminance?

HDR increases the contrast (luminance range) only and is not related to a wider gamut (color space range).

A call for interested parties was issued. Basically some participants are interested, but the cost of potentially required equipment makes them still hesitant. Patrick points out that not everybody needs a 30k EUR display in order to participate.

A short example of a tone mapped HDR video on YouTube was shown.

## Presentation by Catherine Serre (Technicolor)

French national project NEVEX on HDR for broadcasting. The goal is to generate content and to explore everything required for a complete HDR broadcasting chain.

To capture videos, a 3D rig shall be reused with aligned views. An ND filter ius used on one camera to underexpose the images. A special software is sed to compensate for disparities.

HDR CGI content is also generated.

Inverse Tone Mapping is used

* as an alternative method to produce HDR content
* to convert legacy content to HDR

Subjective methods are searched to evaluate the video quality after all steps in the chain.

Objective methods shall ultimately be developed as well.

Some block diagrams of distribution chains are presented.

## Further Discussion

Patrick sees some parallel between MOAVI and HDR

## What VQEG can do

* Revise ITU Recs for subjective testing in order to be suitable for HDR video
* Adapt current objective metrics to process HDR content
* Eventually develop new methods if the existing ones are not sufficient

# JEG

Co-chairs discussed the possible intersections between MOAVI and JEG-Hybrid

# Other Topics

Kjell Brunnstrom elected as new VQEG co-chair

Margaret Pinson elected as new ILG co-chair