VQEG Meeting Minutes

London, October 24-28, 2016

Monday

-Kjell's intro

-Introductions

# Overview of projects

AVHD (Chris):

- Chris expects that we should draw attention to reactiviting the AVHD-SUB, due to new parameters (UHD, HDR, color spaces) coming up.

- Joint project AVHD-AS/P.NATS Phase 2 brief introduction

HDR (Patrick):

- Last six months calibrating methods for HDR part

- Now calibrating models for color gamut

- Did not push the results we have onbtained so far at the ITU level(HDR and color gamut)

Immersive media group (Phil)

- Patrick Le Callet steps down as Co-chair and Jesus Gutierrez from University of Nantes is replacing him

- Trying to make some progress with audio calls, limited success

- This meeting, demo for subjective evaluation in VR, testing methodology

- Proposed to open a call for no reference VR evaluation

- Practices today are not relevent for VR evaluation methodology

- Patrick highlightes the inference of immersive media group from the 3DTV group/projects

JEG-Hybrid (Lucjan)

- Extending the databases

- Improve the way to share the data

MOAVI (Mikolaj)

- Developed a set of quality indicators, there will be a short presentation on Wednesday

- We need to figure out if or why we need to continue, more will be on Friday

QART (Mikolaj)

- Existing tasks were completed, new taks need to be figured out

- Some new ideas are on the table, will be discussed Friday

PsyPhyQA (Sebastian)

- Studying the physiological responses

- Currently working on test plan, number of sequnces, introducing distortion

- A publication on general aspects on physiological based measures

VIME (Michele)

- Current focus is on mobile devices

- Subjective and objective NR image meaures

- A model has been released and available on the VQEG website

- Why no reference model fail, study of corner cases

- How to interpret scores of the proposed NR model

UHD (Naeem):

- Not much activity, a presentation on UHD in this meeting

- A near future plan to go for objective quality metrics for UHD

VLQA (Phill and James)

- VESA, display screen compression algorithms which help the battery life without compromising quality

- VQEG decided to include it as activity as there are no adapted norms to handel this case

- Question at hand is how we collobrate with VESA and push standardization at ITU at the same time

Support groups:

- ILG (Phill): Nothing to report, Phill gave the overview of the group, and how it came into being

- VQEG admin and websupport (Margaret): Any changes to VQEG 8:30-9:00AM, presentations need to be sent by email

- Joint effort group (Patrick): it is difficult to merge winning models to bring a merged model, alternative approach was to develop the model together, that brought

the creation of JEG. Other than AVHD almost all groups are working in joint effort manner. All proposals should be worked out in JEG to be finally given the mandate

of full projects.

# Presentation:

- Test Plan for subjective assessment of VR video quality (immersive media group, Yingxue Zhang)

ACR-HR, single stimuls, DMOS. We cannot control where the user-attention is. Video rotation makes the people sick, view point switch below 10 sec doesnt give enough time

to users to adapt. Free view point is not recommended due to people focusing on different parts of video. Recommeded is free view point with a contstraint on view angle.

Sequence length 10 sec was tested.

Monday October 24, 2016

13:30 – 15:15 session

## Immersive Media Group (IMG) session.

1. Presentation by James Goel.

Title” “Making 5G NR a reality”

Future is driven by 5G new radio technology. The increase in bandwidth makes new technologies in virtual reality (VR) and augmented reality (AR) possible. Opportunity within VQEG study how to evaluate these new technologies in VR.

Qualcomm’s focus is on display-based industries.

Mobile VR headsets vs Tethered VR headsets

Ask from VQEG: analyze and criticize proposed methodologies for visual quality evaluation of AR and VR systems.

1. Lucjan Janowski presentation on the “subject model”, where a subject model is proposed that incorporates subject bias, and error coming from subject and the difficulty in rating the PVS.

Presentation led to a discussion on DMOS versus MOS.

Paper: “The Accuracy of Subjects in a Quality Experiments: A Theoretical Subject Model” by Lucjan Janowski and Margaret Pinson.

# Presentations

1. Patrick Le Callet presentation

Test plan for subjective assessment of virtual reality video quality assessment (VR-VQA).

Open questions on how to design subjective testing, revising the existing methodologies.

Topics that were mentioned included:

* The need for methodologies that scale across devices having difference optics.
* The need to include user information (are subjects allowed to perform the tests standing, sitting, moving…)
* Adding information about user interactivity
* Migrating through the different levels of testing
* Latency between virtual world and the real world
* Comment on the need to not discard the data that cause a subject to abandon a study.
* Addressing the rating scale effect.

Action plan: Build the test plan in layers

1. Narciso Garcia: Presentation on Evaluation of 360VR cinematic stereoscopic DASH service.

UPM has conducted preliminary quality assessment experiments on the minimum bit-rate requirements for the delivery of 360 degree video content (sometimes called 360VR). Some users watched the content seated, while others were standing still or moving around. Assessment outcomes were influenced by user's attitude (position, movement, ...) with

respect to content. Therefore, it should be considered in the specifications of future experiments.

1. Presentation by Mikolaj Leszczuk:

AGH University has resources to run subjective tests through a course on QoE given by Mikolaj Leszczuk.

Call for Problem definition, multimedia content and AGH can run subjective tests.

1. Margaret Pinson Presentation: Why is NR model development failing?

Discussion around why no-reference video models are not yet successful in predicting quality accurately.

Tuesday

# JEG Hybrid

Presentation by Lucjan Janowski (AGH), “JEG-Hybrid database”

Described work in progress to create a new JEG-Hybrid database (storage & access). Issues discussed, such as on how to record the processing chain: free text description or specific information? Editable or non-editable or editable with version control?

Presentation by Ahmed Aldahdooh (University of Nante) & Enrico Masala

Described contents of JEG-Hybrid large scale database. Introduced recent changes and improvements (e.g., the extended database).

Then compared temporal behavior on fast objective video quality measures on this large-scale database.

# High Dynamic Range / Wide Color Gamut (HDR/WCG) Group

New: HDR-VQM metric produced by this group is being used, for example by the MPEG, coding technology group.

Presentation by Vladislav Korotkov (Sky), “Sky's vision on the possible HDR ecosystem, and its challenges”

Challenges include fragmentation among HDR technologies (different standards, TVs); standards maturity (politics, some newer & some older); creating legacy (near future set top box launches, archived video); making it simple for the consumer; and cost

Presentation by Anil Kokaram (YouTube), “HDR in YouTube”

Summarized issues need to choose, such as bit-rates, bits per pixel, color space, codec/container, legacy devices, color metadata, etc.; HDR to SDR color mapping; processing path to ingest and stream videos;

80% of files uploaded to YouTube over the past 4 years have no color metadata (must assume)

G. Ballocca, M. Agostinelli, A. Artusi & A. Mosca, “HDR Boost, a low complexity approach for converting SDR to HDR content”

# Visually Lossless Quality Assessment

Presentation by Phil Corriveau (Intel) and Shun-Nan Yang (Pacific), “New methodologies for visually lossless quality assessment”

Described a proposed alternate method for subjective evaluation of visually lossless quality (i.e., whether or not compression is visually lossless).

Presentation by James Goel (Qualcomm), “Low-Impairment Work for VR AR”

Discussed problems with VR displays due to close proximity to the eye (e.g., overloaded GPU), pixel density needed for perfect visual reproduction (resolution), lens distortion & chromatic aberration (corrected by pre-warping images), simulating VR using mirrors and televisions, evaluating problems when VR is combined with 3DTV

Announcement by Kjell Brunnström (Acreo), “Special session on Visually Lossless Video Quality for modern devices: Research and Industry perspectives”

# VIME

Presentation by Phil Corriveau (Intel), “Crowdsourcing, a validated methodology for performing image quality assessments online”

Information on crowdsourcing image quality assessment. A draft for a Recommendation is posted to the VQEG files for the meeting, for VQEG’ers to consider. Want to give new (junior) researchers guidelines on what to do & what to avoid.

Ask people to read & provide feedback; then drive toward ITU Recommendation in 2017.

This effort should also be connected to the effort of crowdsourcing within QUALINET.

Presentation by Phil Corriveau (Intel), “Interpreting ViQET Scores, when can users see a difference?”

ViQET is the NR image quality metric released by Intel last year. Subjective test run to analyze performance (crowdsourcing and three labs). Reached conclusion: at 0.42 MOS threshold, subjects choose the better quality image 75% of the time for 50% of image pair comparisons (based on lab data, only).

Next steps (proposal) by Phil Corriveau and Michele Saad (Intel), “Call for Open Source Collaboration for No-Reference Models”

Propose VQEG collaboration on no-reference metrics for (1) digital security / surveillance (DSS); and (2) virtual reality(VR)

Drone video also suggested as being of interest.

Interest in DSS: AGH, NTIA, Qualcomm, University of the West Scotland, Intel

Interest in VR: maybe AGH, Qualcomm, Intel, University of the West Scotland

Wednesday

**VQEG London 2016 - Day 3**

[**Link to London 2016 VQEG Presentations, Documents, Photos and Agenda**](ftp://vqeg.its.bldrdoc.gov/Documents/VQEG_London_Oct16/)

**[Kjell]**

8:30am - Review and update minutes from yesterday.  Update agenda

**[Chulhee]**

9am - Review ITU-R WP6C related activities

* Mostly HD related activities

Join Rappaport Meeting ITU-T SG9 Q2, Q12 JRG

* Question 2 - Review Immersive sub testing method for AV stimuli
* Question 12 - Perceptual video quality measurement…

**[Patrick]**

9:20 am -

1. Performance and Robustness of HDR Objective Quality Metrics in the context of recent compression scenarios

* Discussed various re-scaling requirements of the various metrics for comparison of study
* How can we avoid mapping and still test our models? How can we avoid mapping to compare various experimental models with various test data sets?

2. Context of the study: HDR

**Noon [British SkyB Campus Tour]**

1. Tour of the Sky News production and broadcast centre
2. Tour of the Sky Sport/Entertainment production and broadcast centre

**[Lucjan and Mikolaj]**

1:30pm Wrap up of AGH Research

The no-reference problem can be expanded to other use-cases like a sensor for a general methodology for assessment.

\*\* No actions

**[Margaret]**

2pm - QART - Proposal to submit information to the ITU, to enable the creation of an ITU standard that describes the **proper viewing distance from monitors**. This proposal was accepted.

Those interested in contributing to this document:

Acreo (Kjell)

Intel (Phil)

Patrick (U Nantes - LS2N new lab)

Nikola (AGH)

Naeem (UWS)

Shahid (Opticom)

Margaret (NTIA)

Alex (T U IImenau)

Narciso Earcia (UPM)

Chulhee (Yonsei)

**[Margaret]**

2:30pm - You Call this Excellent?

“Video is not an accurate media”

“What image quality do you get from your cameras?”

(See presentation for full report)

\*\* No actions

**[Christian and Alexander Raake]**

3:20pm AVHD (see presentation)

pNATS Phase 1 -- SG12 Question 14

Phase 2 (P.1203)

Thursday

# Minutes 27-10-2016

Lucjan Janowski (AGH)

# eLetter

Decision:

Margaret Pinson will not support VQEG e-letter, her role will be taken by Kjell Brunnström.

# AVHD

Samira Tavakoli (University of Duisburg-Essen)

*Challenges in QoE Assessment of Adaptive Video Streaming*

There was discussion about the need of creating a standard describing subjective experiment methodology for adaptive streaming. The question of accessing the subjective data created by P.NAMS group was considered. Christian Schmidmer can provide some anonimous data from a subjective experiment. Also the difficulty of collecting subjective data for the long term duration PVSs was discussed.

Ioannis Katsavounidis (NETFLIX)

*VMAF open-source metric developed at NETFLIX*

There were lots of questions.

# Administrative

Next meeting.

Decision:

The meeting will be hosted by NETFLIX.

Tentative decision for days: 24-28 April 2017

Proposal:

Adding project leaders for groups which with addition to the typical group activity have also projects focusing on a specific topic. Project co-chairs will decide if such project leaders are needed and they are nominating the project leaders. Some people thinks it is not needed. Maybe if a project is intensive this project could be a new project with new co-chairs. No decision was made.

# AVHD/P.NATS Phase 2

Discussion about the testing methodology. Ioannis Katsavounidis proposed to evaluate the proposed subjective test methodology with the content providers. Florence proposed to consult the proposed method. There was discussion about how cover the whole quality scale. The problem of different devices (mobile or TV) was pointed. Still there are open questions.

# Administrative

The liaison from SG12 was read.

# PsyPhyQA

The test plan was consulted.

Sebastian Bosse (HHI) and Ulrich Engelke (CSIRO)

*Psychophysiology-based QOE Assessment: A Survey*

It was pointed that open databases are needed. A database created in the ContourNET project was described.

# AVHD

Lucjan Janowski (AGH)

*Complexity metric*

Ioannis Katsavounidis proposed to double check the x264 behavior before drawing any conclusion from the presented plots since the obtained QP is not necessary equal to the desired QP.

Andre Seixas Dias (BBC)

*The BBC's open source Turing codec*

The problem of patents related to HVEC was discussed.

Samira Tavakoli (University of Duisburg-Essen)

*Best Practices for Crowdsourced QoE Studies: QoE Crowdtesting*

Numerous questions were answered. Florence asked about the link between the presented activity and VQEG. The answer is that the group working on the crowdsource subjective experiment standard is open for collaboration.

# Proposal

Florence is proposing to work on subjective evaluation for adaptive streaming. Probably this method will not be ready for the AVHD/P.NATS Phase 2 project.

Florence will lead a discussion on the AVHD reflector, to find people interesting in developing improved subjective methods for adaptive streaming, and to form a plan on how to achieve this goal.

# Ultra HD

Chulhee Lee (Yonsei University)

*Perceptual quality analyses of UHD signals*

Numerous questions were answered. Ioannis pointed that it is not the same to generate 30 frames per second from 60 frames per second content by subsampling, as it is to film 30 frame per second content directly in a camera. 30 frames per second are recorded differently on the sensor level.

Friday

Notes for 28/10/16

1. Note taker assignment: Naeem Ramzan
2. Qualinet-VQEG Liaison by Kjell

Action: Kjell has to investigate the difference between VR and Immersive media task force in Qualinet.

1. Presentation: Kingston University Video Quality Research by Maria Martini
2. Presentation: UHD Television by Katy Noland
3. Presentation by Ashutosh Singla
4. VQEG eLetter (Topic: Immersive Media Group will coordinate and update the progress after discussion with co-chairs of the group
5. VQEG meeting discussion
   1. Discussion about timing, breakout session, past and future plans
   2. Suggested improvements: have each group summarize future plans at the end of the meeting. Working groups to provide intermediate status updates.

Action item: AVHD has to come up plan for breakout room and informed within a week.