No Reference Metric (NORM) Group

Goal

- Open collaboration
  - Broadcast
  - User generated content
  - Other applications
- Understand user specifications
- Create training datasets
- Discover research methods
- Develop NR metrics

Metric Specifications

- Root cause analysis (RCA)
- Open-source use rights
- Predict quality directly from camera
- Immediate quality response
- Real-time implementation
- Degrade gracefully
- Adapt to changing user expectations
- …

Audio Visual HD - Adaptive Streaming (AVHD-AS)

- **Co-chairs**

  Shahid Mahmood Satti

  Silvio Borer

- **Goal**

  To develop a multitude of objective models, varying in terms of complexity / type of input / use-cases for the assessment of video quality in adaptive bitrate streaming services over reliable transport.

- **Overview**
  - AVHD/P.NATS2 Project
    - A joint VQEG and ITU SG12 collaboration
    - 10 model categories, models trained and validated on 26 subjective databases.
    - Resulted in 4 ITU standards
      - ITU-T Rec. P.1204
      - P.1204.3, P.1204.4, P.1204.5
    - Long-term integration models
    - Publications

Immersive Media Group

- **Mission:** Quality assessment of immersive media: 360-degree content, virtual/augmented/mixed reality, light field/plenoptic content, 3D content (stereo, multiview, FVV, etc.)…

- **Goals:** Baseline quality assessment of today's systems
  - **Datasets** of immersive media content
  - **Subjective test methods, QoE guidelines, objective metrics, etc.**

- Current joint work:
  - IMG test is investigating the quality assessment of 360-degree video.
    - Test plan: https://www.its.bldrdoc.gov/vqeg/projects/immersive-media-group.aspx
    - Overview presentation in this meeting.
  - Collaboration with ITU-T SG12, Question 13 → ITU-T P.919 (ex P.360-VR).
  - Following and contributing MPEG AHG on Quality of Immersive Media.
  - Future joint works? → Presentation from Pablo and open discussion.

- Presentations of IM-related topics are welcome: 6 presentations in this meeting.

- Email reflector: img@vqeg.org

Statistical Analysis Methods (SAM)

Chair: Lucjan Janowski
Vice-chairs: Zhi Li, Ioannis Katsavounidis, Patrick Le Callet

Mission
- Improve analysis methods and understanding of subjective experiments.
- Improve the statistical analysis of objective media quality predictors/models.

Working Methods:
- To join the SAM mailing list (vqeg-sam@googlegroups.com) please send an e-mail to the chair at janowski@kt.agh.edu.pl
- We have regular calls one per four weeks on Monday at 17:00 CET. Minutes can be found in **this document**.
- Zhi prepare a **github repo**: https://github.com/Netflix/sureal

Since last meeting
- Discussion with ITU-T (P.913) and ITU-R (BT.500) about including new method for data analysis based on model:

$$U_{ijr} = \psi_j + \Delta_i + \upsilon_i X$$

- Discussing new methods, most of them are presented at this meeting

This meeting
- [Patrick/Jing] on active sampling (or "A Probabilistic Graphical Model for Analyzing the Subjective Visual Quality Assessment Data from Crowdsourcing" from ACM MM'20)
- [Jakub/Lucjan] Describing Subjective Experiment Consistency by p-Value P–P Plot (from ACM MM'20)
- [Jakub/Lucjan] suJSON: A Uniform JSON-based Subjective Data Format
- [Lucjan] discussion on how should we define the true quality
- [Zhi] updates on VMAF new progress
- [Margaret] Confidence interval for objective metrics
- [Zhi/Lukas] updates on MLE technical aspects (the IRG meeting will focus on standardization - if time permits)

Psychophysiological Quality Assessment (PsyPhyQA)

Co-Chairs

- Naeem Ramzan
- Sebastian Bosse

Goals

- Study the psychophysiological underpinnings of quality perception
- Develop psychophysiological test paradigms for quality assessment
- Develop data processing methods for psychophysiological quality assessment
- Validate psychophysiological quality assessment methods

What has been done

- Established a test plan for psychophysiological video quality assessment

What do we expect during this meeting

- Develop ideas to do PsyPhyQA in times of a pandemic
- Collect and discuss ideas about possible joint works
- Learn about physiological correlates of simulator sickness

Quality Assessment for Computer Vision Applications (QACoViA)

Mikołaj Leszczuk (AGH University of Science and Technology, PL)

Patrick Le Callet (University of Nantes, FR)

Lu Zhang (National Institute for Applied Sciences Rennes, FR)

QACoViA Mission and Background

- Mission:
  - To study the visual quality requirements for computer vision methods
- Background:
  - Methods for Visual Quality assessment are used to estimate or mimic human judgement when rating the quality of visual media for general purpose; these methods are not necessarily appropriate when the final observer is a computer vision algorithms, notably performing a specific task (e.g.: recognition tasks …)
  - Therefore, the correct estimation of video processing pipeline performance under various conditions is still a significant research challenge in Computer Vision (CV); responding to this need, the goal of the group is to study:
    - Testing methodologies and frameworks to identify the limit of CV methods with respect to the visual quality of the ingest
    - Minimum quality requirements and objective visual quality measure to estimate if a visual content is the operating region of CV
    - To deliver implementable algorithms being a proof/demonstrate of the new proposal concept of an objective video quality assessment methods for recognition tasks

QACoViA News

- 3rd co-chair:
  - Lu Zhang from National Institute for Applied Sciences (INSA) Rennes, France
- Completing project: "Objective Video Quality Assessment Method for Recognition Tasks" (Huawei Innovation Research Programme) by AGH:
  - Estimation of video processing pipeline performance still posing research challenge in Computer Vision (CV) tasks
  - Showing possibility to deliver objective video quality assessment method for Target Recognition Video (TRV)
  - More info: QACoViA session, Wed. 16 Dec. 14:00 CET

- Starting project: "Image compression for optimized Recognition by distributed Neural Networks" by INSA Rennes/IETR, 10/2020-… :
  - The objective of this PhD thesis project is to address the challenge of minimizing the amount of data transmitted by IoT sensing devices and fed to AI algorithms. A quality metric is necessary in this scenario to define the minimum value that is just high-enough for enabling a correct interpretation by AI techniques.

COMPUTER GENERATED IMAGERY

Saman Zadtootaghaj, Nabajeet Barman

VQEG Meeting
December, 2020

General Information

- The main focus is devoted to analyzing and evaluating of computer-generated content

- What to expect in this meeitng:
  - Subjective and Objective assessment methods for CG/MG and 3D graphics

- Institutes that are active
  - Kingston University, Technische Universität Berlin, Simula, TU Ilmenau, Tencent media lab

CGI Activities

- **Assessment Methodologies:**
  - Methodologies for quality assessment of gaming services (e.g. <u>ITU-T P.809)</u>
  - Crowdsourcing quality assessment for gaming application (P.CROWDG)

- **Quality Prediction of Cloud Gaming (activities at ITU-T SG12)**
  - Opinion model for cloud gaming (ITU-T Recommendation G.1072)
  - Monitoring model (ongoing – ITU-T P.BBQCG)

- **Video Quality Assessment for CGI content**
  - Signal based models (nofu, NDNetGaming, GamingPara, DEMI, NR-GVQM, etc.)
  - Bitstream, Parametric based models (GamingPara, 1204.3)

- **Other Activities:**
  - Quality Enhancement (QoMEX2020), Video Game Genre prediction (MMSP2020)
  - Codec Comparison (QoMEX2020)

Tools and Datasets

- **Public tools for Quality assessment:**
  - *NDNetGaming: https://github.com/stootaghaj/NDNetGaming*
  - *Demi: https://github.com/stootaghaj/demi*
  - *GamingPara: https://github.com/stootaghaj/GamingVQA*
  - *ITU-T Rec. G.1072: https://github.com/stootaghaj/ITU-G1072*
- **Public Datasets:**
  - *GVSET: https://kingston.box.com/v/GamingVideoSET*
  - *KUGVD: https://kingston.box.com/v/KUGVD*
  - *CGVDS: https://github.com/stootaghaj/Cloud-Gaming-Video-Dataset*
  - *GISET: https://github.com/stootaghaj/GISET*

Planned Activities

- **Administrative level**
  - ➢ Identifying other topics and interests in Computer Generated Imagery rather than gaming content
  - ➢ Planning interim meeting for getting attention

- **Research level**
  - ➢ Move from planning model to monitoring model
  - ➢ New gaming dataset, HDR, 4k resolution
  - ➢ Content analysis for gaming content
  - ➢ Develoment of a tool for NR metrics and models for assessing gaming QoE
  - ➢ Enhancement Techniques for Gaming Content

JEG HYBRID WG OVERVIEW – VQEG DEC 2020 MEETING

- Joint Effort Group on the development/research of generally applicable hybrid video quality assessment algorithms
  - To develop <u>a generally applicable</u> no reference Hybrid Perceptual/Bit-Stream model
  - Currently using a large scale DB with 60,000+ PVS with many full-reference objective VQMs
- Current activities
  - Collaboration with Sky Group: determining when video quality metrics are likely to inaccurately predict the MOS
  - Artificial intelligence-based observers for media quality assessment: modeling single observers' quality perception
  - Published papers: Springer J. Multimedia Tools and Applications, HVEI Conference 2020, ICASSP 2020
- How to get involved
  - Subscribe to the VQEG-JEG mailing list, Join our biweekly conference call
  - http://vqegjeg.intec.ugent.be/wiki/ (notably section "resources", constantly updated, volunteers welcome!)

Quality Assessment for Health Applications (QAH)

- **Co-chairs**

  Lu ZHANG

  Meriem OUTTAS

  Hantao LIU

- **Goal**
  - Assemble all the existing publicly accessible databases on medical quality
  - Construct some new databases for different tasks jointly
  - Use deep learning for QAH as well as visual attention
  - Explainable AI for ophthalmology, microscopy quality assessment
  - Metrics and models supporting interpretability for diagnosis

- **What has been done**
  - 1st meeting on 26/11/2020 :

    To know how many people are interested in this project, what each member has already done on medical images, what each member wants to do in this joint project…

- **What can we expect during this meeting**
  - Share our experiences on related studies
  - Collect ideas about possible joint works

5GKPI meeting (Chair Pablo Pérez, Vice-Chair Kjell Brunnström)
F2F meeting

- Study the relationship between the Key Performance Indicators of new communication networks (namely 5G, but extensible to others) and the QoE of the video services on top of them

- Present Use Cases of interest
  - [#120] Tele-operated Driving – Yungpeng Zang (5G Automotive Association)
  - [#121] Content Production – Paola Sunna (EBU)
  - [#122] AR/VR – Bill Krogfoss (Bell Labs Consulting)
  - [#123] 5G and QoE for remote controlled use cases – Kjell Brunnström (RISE)

- Discuss follow-up actions
  - Contribution to ITU-T SG-12
    - G.QoE-5G work item → Open scope, we could make a proposal
    - Use-case oriented QoE models / competitive task → if interest from ITU, industry, and potential proponents
  - Generation of open/reference datasets
  - Interested partners

VQEG @ ACM SIGMM Records

- SIGMM Records are the SIG Multimedia's quarterly newsletter.
  - Provide an opportunity to publish information *about* successful research and background stories.

- Available as an ACM newsletter series with the ISSN 1947-4598 in: SIGMM website at http://sigmm.org, Records website http://records.sigmm.org , the ACM Digital Library.

- One of the sections of the Records is related to reports from standardization organizations: MPEG, JPEG… **now VQEG!:** Thanks to Pablo César (EiC) for his invitation.

- Good possibility to disseminate VQEG activities:
  - June 2020: Introduction of VQEG (e.g., mission, main activities, etc.).
    http://records.sigmm.org/2020/06/30/standards-column-vqeg/

  - September 2020: Recent contributions to ITU recommendations: http://records.sigmm.org/2020/10/07/vqeg-column-recent-contributions-to-itu-recommendations/

  - Next issue (Dec. 2020): Report of the VQEG plenary meeting.
    - Expected: Two issues per year will be covered with reports form the meetings.

  - What more? Any ideas are welcome! → Send email to jesus.gutierrez@upm.es and kjell.brunnstrom@ri.se

14/12/2020

Human Factors for Visual Experience (HFVE)

Chair: Prof Maria Martini, Kingston University London

Vice-Chair: Prof Patrick Le Callet, University of Nantes

The group focuses on the coordination of VQEG activities in liaison with the IEEE Standards Association Working Groups on HFVE, especially on the following items:

- Perceptual Quality Assessment of Three Dimensional (3D), Ultra High Definition (UHD) and High Dynamic Range (HDR) Contents
- Quality of experience assessment for VR and MR based on human factors
- Quality assessment of light-field imaging contents based on human factors
- Deep Learning-Based Assessment of Visual Experience Based on Human Factors.

Examples activities:

- Co-located meetings
- Contributions from VQEG members to IEEE Standards on HFVE
- Updates on the status of the standards in VQEG meetings.

Website, FTP site, and reflector support

- FTP site ported
  - End-of-life Linux → Windows
  - Performance should improve
  - Obsolete files deleted
  - Videos moved to Consumer Digital Video Library (CDVL)

- Email reflectors update
  - Self register
  - Aliases removed
  - Performance should improve

- Send VQEG website update requests to Margaret Pinson

The Joint Effort Group (JEG)

- Co-Chairs Kjell Brunnström, Patrick Le Callet

- Promotes collaborative efforts as an alternative to the traditional way of working. Usually VQEG evaluates models performance from proponents with respects to jointly developed testplans in a competitive manner.

- No activity as it is no longer needed

- Need to discuss the future of JEG

eLetter

- Editors-in-chief Naeem Ramzan, Kjell Brunnström

- Provide a timely update on recent developments, hot research topics, and society news in the area of video quality.

- Last issue about immersive media

- No issue has been coming out recently due to author changing their minds.

- Moving forward with publishing on individual contributions

- Maybe, an issue based on all live projects?