

JEG-Hybrid

Joint Effort Group

Updates on JEG-Hybrid Activities Inclusion of IGVM

Enrico Masala
Politecnico di Torino University, Turin, Italy

VQEG Jun 2023 Meeting

Original Mission and Current Focus

- Originally: develop a no reference Hybrid Perceptual/Bit-Stream model
- Over the last few years, the activities gradually evolved over time to include several areas of Video Quality Assessment (VQA)
 - Tackling new **research questions** with hopefully **long term impact** on the video quality research community
 - Currently, not directly seeking the development of new metrics or tools readily available for VQA
- At last VQEG meeting (Dec 2022), agreed to **move the activities of IGVQM** (Implementer's Guide to Video Quality Metrics) into JEG-Hybrid

Implementer's Guide to Video Quality Metrics: scope

- Originally, IGVQM had a quite **broad scope** (see working doc [1]), e.g.
 - Priority to full-reference (pixel) metrics, but also applicability of no-ref
 - Use at least all metrics in VMAF library, focus on open-source solutions
 - Offer temporal aggregation methods of image quality metrics into video ones
 - Statistical analysis of existing subjective datasets (limited to compression and scaling)
 - Offer standard logistic mappings of objective metrics to normalized linear scale

[1] <https://docs.google.com/document/d/1w3rgGxDHFehwdwtVXENtngAPsMhGnPIAsiU2v0Tu6nU/edit?usp=sharing>

IGVQM within JEG-Hybrid

- Original IGVQM group had many **manifestations of interest** [1]
 - Decide **who is still interested** ?
 - How / how much effort they can contribute
 - Running the measures
 - Making them available in standardized forms
 - Performing statistical analysis
 - Drafting reports/documents/publications
 - In which form (e.g., direct collaboration, thesis proposals, etc.)

[1] <https://docs.google.com/document/d/1w3rgGxDHFehwdwtVXENTngAPsMhGnPIAsiU2v0Tu6nU/edit?usp=sharing>

VQEG's Implementer's Guide to Video Quality Metrics (IGVQM) project

By: Ioannis Katsavounidis, Research Scientist, Video Infrastructure, Facebook Interim VQEG-IGVQM chair

With additional input from:

- Chulhee Lee (chulhee@yonsei.ac.kr)
- Werner Robitza (werner.robitza@gmail.com)
- Tony Orchard: anthony.k.orchard@intel.com
- Lucjan Janowski: janowski@kt.agh.edu.pl
- Zachary Plovanic: zachary.plovanic@intel.com
- Vittorio Baroncini: baroncini@gmx.com
- Nabajeet Barman (nabajeet.barman@kingston.ac.uk)
- Mikolaj Leszczuk (mikolaj.leszczuk@agh.edu.pl)
- Zhenzhong Chen (zzchen@whu.edu.cn)
- Silvio Borer: silvio.borer@rohde-schwarz.com
- Jesús Gutiérrez: jesus.gutierrez@upm.es
- Lukas Krasula (l.krasula@gmail.com)
- Joel Jung (joeljung@tencent.com)
- Femi Adeyemi-Ejeye (femi.ae@surrey.ac.uk)
- Denkhan Samilgil (denkhan.samilgil@divitel.com)
- Kjell Brunnström (kjell.brunnstrom@ri.se)
- Steve Göring (steve.goering@tu-ilmenau.de TU Ilmenau)
- Alexander Raake (alexander.raake@tu-ilmenau.de)
- Rakesh Rao Ramachandra Rao (rakesh-rao.ramachandra-rao@tu-ilmenau.de)
- Glenn Van Wallendael (Glenn.VanWallendael@UGent.be)
- Marta Orduna (moc@gti.ssr.upm.es)
- Prami Mazumdar (pramit.mazumdar@iiitvadodara.ac.in)
- Jing Li (jing.li.univ@gmail.com)
- Saman Zadtootaghaj (Saman.Zadtootaghaj@dolby.com)
-

JEG-Hybrid Initial Contribution

- To start with limited resources, JEG-Hybrid proposes to
 - Restrict the scope (at least initially) by focusing on some specific aspects (e.g., temporal pooling)
 - Start with the already available objective measures (e.g., HDTV, ITS4S)
 - Try to create synergies between the current JEG-Hybrid activities and the IGVMQ ones
 - Include the existing JEG-Hybrid experimentations on AI observers while carrying out some of the activities envisaged by IGVMQ, e.g., objective metrics computation and analysis

Proposed Roadmap

- Make already computed objective measures available in some **easy-to-process standard format**, do the same for subjective assessment data
- **Run objective measures** for all the datasets (hopefully making the procedure as much reproducible as possible)
 - Using libvmaf or other open source tools
 - Potential datasets already [listed by IGVQM here](#)
- Tackle some other points listed in the scope of the original document [1] and start addressing them
 - E.g., temporal pooling

Database name	Contributor	Year	# of sources	# of PVS	# of opinion scores	Methodology	Scale (discrete/continuous)	Scalability
FOO	BAR	2008	30	300	9000	ACR	Discrete	
VQEG HD 1 to 5	VQEG	2010				ACR-HR	Discrete	
ITS4S	NTIA/ITS	2018				ACR	Discrete	
ITS4S2	NTIA/ITS	2019				ACR	Discrete	
ITS4S3	NTIA/ITS	2019				ACR	Discrete	
ITS4S4	NTIA/ITS	2020				ACR	Discrete	
CCRIQ	Intel, ITS, U. Gh	2016				ACR	Discrete	
Public Safety #1	NTIA/ITS	2005				ACR-HR	Discrete	
Public Safety #2	NTIA/ITS	2006				ACR-HR	Discrete	
T1A1	ATIS	1996				DSIS	Discrete	
GamingVideoSET	KU	2018	6	90	2250	ACR	Discrete	
KUGVD	KU	2018	6	90	1530	ACR	Discrete	
AVT-VQDB-UHD-1	TU Ilmenau	2019	12	756	around 18,000	tACR	Discrete	
AGH/NTIA/Dolby	AGH, NTIA, Dolt	2018				ACR-HR	Discrete	

Comments / Proposals / Ideas

- Feel free to do it **now!**



- Join our biweekly conference call (next: **Jul 10, 2023, 4pm CEST**)
- Other references:
 - **JEG-Hybrid website** <https://vqegjeg.github.io/jeg-hybrid/>
 - Including a new up-to-date publication section with immediate download link for each one
 - Subscribe to the VQEG-JEG mailing list: jeg@vqeg.org
 - <http://www.its.bldrdoc.gov/vqeg/email-reflectors.aspx>