

VQEG JEG

Marcus Barkowsky, Glenn Van Wallendal, Lucjan Janowski



Motivation

- Collaborative effort on video quality assessment
- Research requires knowledge and skills in:
 - Subjective evaluation of video quality
 - Human visual perception
 - Video coding algorithms
 - Transmission schemes and network protocols
 - Statistical analysis
 - Machine learning
 - Data mining
- Reliable and reproducible results shall be in focus
- Collaborative efforts are mandatory to improve the state of the art

Why a large scale database?

- Learning about the accuracy of objective measurements with respect to various application scopes
- Automatic Identification of « critical cases »
- Identification of insufficient algorithmic modeling precision OR missing perceptual features
- Characterisation of algorithmic indicators within-scope / out-of-scope / in-extended-scope
- Reproducible verification procedures due to known conditions
- New methods for machine learning and data mining
- Finally: Determining missing modeling factors, eventually requiring further perceptual/psychovisual research

Advances

- Currently available – for free download
 - 12.960 AVC encoded video sequences database
 - Objective scores for each sequence: SSIM, PSNR, VQM, PVQM
 - First statistical analysis published (Globecom 2013)
 - 59.520 HEVC encoded video sequences database
 - Objective scores for each sequences: SSIM, PSNR, VQM, PVQM
 - First statistical analysis published (VPQM 2015)
 - Robust reference decoder (packet loss simulation)
 - For AVC
 - For HEVC

Ongoing work

- Biweekly meetings will continue
- Creating an UHD HEVC encoded database from 31 contents in 3 resolutions (UHD, 1080p, 720p)
- Running subjective assessment on UHD HEVC database
- Further statistics on the large scale database:
 - Blind performance estimation of objective measurements
 - Determining subset for subjective testing
- Creation of a relational database for the FR measurement results
- Inclusion of more objective measurement algorithms (ex. MOAVI)
- Reproducible creation of the databases with a Virtualbox
- Contribution of T-Labs: Python implementation of P.1201.2

Future work

- Evaluating performance contribution of individual indicators to more complex algorithms
 - in general
 - with respect to a specific scope
- Development of adapted fusion and machine learning algorithms
- Statistical tools for robustness analysis

Recent Publications

- Barkowsky, M., Masala, E., Van Wallendael, G., Brunnstrom, K., Staelens, N., & Le Callet, P. (2015). Objective Video Quality Assessment — Towards Large Scale Video Database Enhanced Model Development. *IEICE Transactions on Communications*, E-98b(1), 2–11.
- Van Wallendael, G., Staelens, N., Masala, E., Janowski, L., Berger, K., & Barkowsky, M. (2014). Dreamed about training, verifying and validating your QoE model on a million videos? *VQEG eLetter*, 1(2), 19–29.
- Van Wallendael, G., Staelens, N., Masala, E., & Barkowsky, M. (2015). Full-HD HEVC-Encoded Video Quality Assessment Database. *Ninth International Workshop on Video Processing and Quality Metrics (VPQM)*, .

Presentations

- Glenn Van Wallendael:
Full-HD HEVC-Encoded Video Quality Assessment Database
- Muhammad Shahid: On Bitstream Features based Perceptual Quality Estimation of HEVC Coded Videos
- Enrico Masala:
The large scale database – Packet loss simulation