Master 2 internship

Title: Video quality assessment in the compressed domain

Subject:

The aim of this Master 2 internship is to study Video Quality Assessment (VQA) algorithms adapted directly into the compressed domain taking into account the variability of codecs and the specificity of video coding. Yet, instead of scoring the quality of video by a single value, a continuous notation of the quality will be preferred. The problem of perceptual video quality assessment is a significantly more complex problem than the still image one for the following reason: while there exist highly reliable models of still natural scene statistics, the literature for regular natural video statistics models is almost absent. For instance, the interaction between motion and spatio-temporal changes is of particular interest, especially with regards to whether motion is involved in masking distortions. The type of motion which occurs in a video is a function of object and camera movements. One challenge is how the aforementioned phenomenon can be modeled into the compressed domain?
The candidate will investigate how the design of existing relevant features in the wavelet domain, frequency domain and/or spatial domain, or temporal domain could be adapted in the compressed domain.
The use of Deep Learning to design such a VQA scheme could be investigated too.

Candidate profile:
- Master 2 student in computer science with specialization in Computer Vision and Pattern recognition.
- Knowledge in video compression standards (H.264 and/or H.265)
- Good skill in Matlab, C, C++.

Application:

Applications should include the following:
- Letter of interest
- Official transcripts (with grades and ranking) for Master 1 and Master 2 (or equivalent)
- Scientific CV

Benefits:
- Duration: 5 months
- Place: GREYC UMR CNRS, 6 Bd Maréchal Juin, 14000 Caen
- Salary: 554.40 € monthly

Contacts: Alexandre Ninassi (alexandre.ninassi@ensicaen.fr)
Christophe Charrier (christophe.charrier@unicaen.fr)

References

[1] Z. Wang and A. C. Bovik, Reduced and no reference visual quality assessment: The natural scene statistics model approach, IEEE Signal Process. Mag. , vol. 29, no. 6, pp 29-40, Nov. 2011

[2] A. Tsifouti, S. Triantaphillidou, M. C. Larabi, G. Doré, E. Bilissi, A Psarrou, The effects of scene content parameters, compression and frame rate on the performance of analytics systems. Image Quality System Performance, Electronic Imaging Symposium, San Francisco, CA, 2015.

[3] A. Tsifouti, S. Triantaphillidou, M.-C. Larabi, E. Bilissi, A. Psarrou, A case study in identifying acceptable bitrates for human face recognition tasks. Elsevier Sig. Proc.: Image Comm. 36: 14-28 (2015).

[4] M. Saad, A. C. Bovik, and C. Charrier, "Blind prediction of natural video quality," IEEE Transactions on Image Processing, vol. 23, pp. 1352–1365, 2014