IMT Atlantique
Bretagne-Pays de la Loire
École Mines-Télécom

Project: Video Compression

Objectives of the project

The objective of this project is to **implement a video compression solution**, and to evaluate its performance in terms of rate and distortion. Since this is a project, only some suggested main steps are provided. You may refer to the course and to some other references in order to find out what can be done. Of course, you can also consider what you've done in previous labs, and use the Matlab functions provided in these labs.

Evaluation

The project will be evaluated from the following deliverables:

- A Matlab code provided as a demo: for instance one or two scripts calling some other functions, doing the encoding/decoding of the video and evaluating the performance.

- A 10 minutes speech presenting the main steps of the solution, and the obtained results.

Suggested steps

1. A few videos are provided in qcif format. You can try to open the qcif files with the provided function *yuv_readimage*.

2. Propose a complete solution to encode the images of the video independently from each other. Evaluate the performance in terms of rate and distortion.

3. Use predictive coding to encode the successive images with respect to each other. You may use motion compensation in order to improve the performance. Evaluate the performance in terms of rate and distortion.

4. **To go further/only if you have some time**: Imagine that you want to compress your video for streaming. Propose a solution that minimizes both the coding rate of the whole video, and the rate needed to transmit the video to a user which would start at a random time in the video.

References

[1] G. Mercier *Technologies du multimedia* Télécom Bretagne, 2014

[2] C. Ken and P. Gent. *Image compression and the discrete cosine transform.* College of the Redwoods, Tech. Rep, 1998.

[3] T. Borer and T. Davies *Dirac: une solution ouverte pour la compression vidéo* Département R&D de la BBC, Royaume-Uni, 2005

[4] Yao Wang. *Motion Estimation for Video Coding* Polytechnic University, Brooklyn, NY11201, 2003

[5] Aroh Barjatya *Block Matching Algorithms for Motion Estimation* DIP 6620 Spring 2004 Final Project Paper https://fr.mathworks.com/matlabcentral/fileexchange/8761-block-matching-algorithms-for-motion-estimation