MPEG 2 Video Compression

ENEE631 Digital Image Processing

Project 2

Due: 16 May 2011

Implement a MPEG-2 Encoder to compress the frame (uncompressed) of a video. Use the dataset provided with the project. Your design should have the following blocks.

1. **Motion Estimation**: Choose a mix of "Intra", "Forward", and "Backward" predictive schemes for motion estimation.

2. **Encoding**: Encode the residue (per frame), the motion vectors and the quantized intra-frame-coding coefficients. Encode the symbols using an entropy coding scheme. Use Run-length coding if necessary.

3. **Decoding**: Decode the bit stream to reconstruct the original frames

Note:

1. You are free to choose your preferred programming languages. But if you plan to use something other than the MATLAB or the c/c++ languages, please contact your TA. Make sure that your code can be compiled and executed in the TA's computer.
2. You have to provide a readme file explaining your file structure and how to compile them.
3. You have to provide a demo program. The demo program should do the following things. (a) Read an input video (b) Encode the video to a binary file (c) Read the binary file (d) Decode the binary file (e) display both the input and output videos.
4. A modular implementation will help you in reusing and organizing your codes.
5. The templates of the technical report will be provided in the course website. **Your report should be within 8 pages** including all the figures and references. Please carefully plan your space.

Submission

1. Pack all of your codes in a single file, rename it as enee631_project2_code_yourlastname.zip, and email it to your TA before **EST 11:59pm 5/15/2011**. Late submission is not accepted.
2. Your report should be in the PDF format and rename as enee631_project1_report_yourlastname.pdf. Send an electronic version to your TA before **EST 11:59pm 5/15/2011**. Late submission is not accepted.
3. Example: If your last name is Liu, your code should be renamed as **enee631_project2_code_liu.zip** and your report should be renamed as **enee631_project2_report_liu.pdf**.