Digital Video Processing, SGN 3106, Winter 2010-11

Exam: April 14th, 2011 – Extraordinary session

NOTES:
- Correctness in English is NOT taken into account in the evaluation of the exam.
- *Hint 1: "brief" and "short" indicate that 3~5 lines of answer are sufficient. The capability of understanding well the question and summarizing efficiently the important technical aspects is a "plus".*
- *Hint 2: Please be focused in your answer. If I ask "what is a motion vector" do not write a three-page description of a video codec.*

1. What is the *ringing artifact?* What causes it?

2. What are the assumptions that are made about the motion in a video encoded with the most common video coding algorithms (MPEG-2, H.261, H.263, etc)? What happens if these assumptions are not satisfied? Give a simple example of a scene in which these assumptions are not satisfied.

3. Provide a short explanation of the following terms:

   (a)   Quality factor (JPEG)
   (b)   Search Window.
   (c)   Zig-Zag scanning
   (d)   Displaced Frame Difference (DFD)
   (e)   Preventive refresh

4. Draw a block diagram of a basic video **encoder** (such as the H.261 encoder), which is based on motion compensated prediction and DCT coding of the prediction error. The input to the encoder is a sequence of video frames, and the output is a compressed video bitstream. Identify the blocks where a coding control system can act in order to control the output bitrate.

5. What is *progressive downloading?* What kind of requirements does it set upon the structure of the audio/visual media file?