IMAGE PROCESSING (RRY025)

STUDIO EXERCISES

Lecture 13, Image Compression -I

On the windows system to use m-files written for the course you must in windows after starting MATLAB type

```
addpath \\mfil.me.chalmers.se\course-err041
```

If you are using the linux operating system after starting MATLAB you should type

```
addpath /chalmers/groups/course-err041
```

EX 1. Image Histogram Entropy

Start matlab, type **pout=imread('pout.tif');**. Type **calcent(pout);** to display the image histogram and calculate the single pixel entropy. **Question**. Given that the input image has 256 gray levels (8 bits) what degree of lossless compression is possible using single pixel entropy coding?

Load the cameraman.tif, saturn.tif and ic.tif images, using **cam = imread('cameraman.tif')** Use **calcent** to display histograms and calculate entropies. **Questions**. Which image can be compressed most by lossless compression? How is the the amount of compression related to the shape of the image histograms?

EX 2. Entropy of Difference Images

Type **dcam = difim(cam);** to calculate a version of the input image where each pixel is differenced with with the previous pixel on the same row. i.e. it uses a 'Mapper' which is the difference between pixels. Calculate the entropy of this difference image using **calcent**. **Questions** What degree of compression is possible if we entropy encode the difference image? Is this still a lossless form of compression? Which of the images can be compressed most? Are there are any disadvantages to this form of image compression?.