**CM0669 Machine Learning and Computer Vision**

**Lab 6** Introduction to Computer vision, image and video representation

**1. Compression ratio - Pictures and videos**

Open up Matlab and Type in ‘help imread’ and ‘help imwrite’. A helpful description will be given on the built-in functions ‘imread’ and ‘imwrite’ for reading and saving digital pictures. The built-in function ‘imshow’ can be used to display an image.

1. Download the pictures on Blackboard and the Matlab code ‘read\_display\_picture.m’ (default file is image1.jpg’) in a folder Week6. Execute the Matlab code on the other pictures and calculate the compression ratio for each image.
2. Download the test videos and the other files in the same folder (Week6). The Matlab code ‘read\_play\_video.m’ reads a video (default ‘video1.mpeg’) and plays the sequence of frames at the corresponding frame rate. Ensure you unzip and add subfolders ‘mmread’ and ‘mmwrite’ in the current directory by using the Matlab command ‘pathtool’. Calculate the compression ratio for each video.

**2. Image and video Manipulation**

1. Amend the previous Matlab code ‘read\_display\_picture.m’ to display and save the following for Image3.jpg:
2. Red component image (save it as Image3\_Red.jpg)
3. Green component image (save it as Image3\_Green.jpg)
4. Blue component image (save it as Image3\_Blue.jpg)
5. Red and Green component image (save it as Image3\_Red\_Green.jpg)
6. Red and Blue component image (save it as Image3\_Red\_Blue.jpg)
7. Green and Blue component image (save it as Image3\_Green\_Blue.jpg)

Interpret the results.

1. Amend the previous Matlab code ‘read\_display\_video.m’ to get a processed version of ‘Video1.mpeg’ as follows and display the first 10 frames. Use ‘mmwrite.m’ to save the processed videos
2. Red component video (save it as Video1\_Red.avi)
3. Green component video (save it as Video1\_Green.avi)
4. Blue component video (save it as Video1\_Blue.avi)
5. Red and Green component video (save it as Video1\_Red\_Green.avi)
6. Red and Blue component video (save it as Video1\_Red\_Blue.avi)
7. Green and Blue component video (save it as Video1\_Green\_Blue.avi)

Interpret the results.

**Hints**: use ‘mmwrite.m’ to save the processed videos.

1. You are provided with a Matlab programme (Insert\_logo\_Picture.m) which inserts a logo (picture ‘logo.jpg’) at the top left side of a picture (default Image1.jpg). Write another Matlab programme which inserts the same logo into a one of the original MPEG videos (Video1.mpeg or Video2.mpeg). Ensure you include a code to play the video and then save it as an AVI file.