

## Master 1 Informatique - IFLBX030 Introduction à l'analyse d'images

### Practical session - Features & image matching

#### Exercise - Texture

The images 'zebra\_1.tif', 'zebra\_2.tif' ... 'zebra\_6.tif' (which can be found in the image folder), contain some fine specimens of a particularly textured herbivore. We will try to implement a zebra-detector by analyzing texture.

1. First, try to implement your own GLCM-function that takes as an input an image window and the number of image grayscales and outputs a co-occurrence matrix. Derive *variance*, *contrast* and *entropy* from the GLCM of a sliding window of a suitable size.
2. Try to use a simple thresholding of these features to mask out the zebras in the images.
3. Compare your result with the first order texture measurements: *variance* and *entropy* by using built-in functions from some suitable library.
4. Compare your result with an existing implementation of the LBP (Local Binary Patterns) from some suitable library.

#### Exercise – Features matching between images

Familiarize yourself with openCV functions:

[https://docs.opencv.org/4.x/dc/dc3/tutorial\\_py\\_matcher.html](https://docs.opencv.org/4.x/dc/dc3/tutorial_py_matcher.html)

#### Exercise – Image features and region moments

1. From a binary image, create a region label image to study the region properties.
2. For all objects in the label image, compute moments, and from them, the area and centroid of the object.
3. Compute statistics about properties of the objects in the image
4. By computing the central moments of each object, we can obtain the object's orientation.