ESTIN

Pattern recognition for image analysis

S5 2024-2025

Lab° 03

Exercise1:

- Select four patches from both background and lesion areas of the image (from…\lab3_images\training\IMD016.BMP).
- display the original image with locations of patches .Display the image patches
- Compute the GLCM for every patch (use **greycomatrix** from skimage.feature). Derive energy, contrast, dissimilarity, and correlation from the GLCM (use **greycoprops** from skimage.feature).
- For each patch, plot (dissimilarity vs. energy)

Exercise2:

- Load the image IMD016.BMP and its label IMD016_label.BMP (from training file)
- Generate Gabor features. Show the different Gabor filters (use **getGaborKernel** from cv2) and their corresponding filtered images (**filter2D** from cv2).
- Create a machine learning model and train it using the extracted features.
- Use the trained model to segment the test image (from testing file).
- Display both the segmented image and its true label.

Exercise3:

- Implement the **region growing** segmentation algorithm.
  This algorithm starts from a seed. The initial region first contains this seed and then grows according to
  - ✓ a growth mechanism (N_4 or N_8)
  - ✓ an homogeneity rule (predicate function)