Computer Vision

Programming Task 03

Implement the histogram equalization discussed in class today using MATLAB or Python.

Tasks to be implemented

1. **Function definition:** Define a function **histogram_equalization(image)** that takes a grayscale image as input. The function should perform the following steps:
    - Calculate the histogram of the image.
    - Compute the cumulative distribution function (CDF) of the histogram.
    - Normalize the CDF to obtain a probability distribution function (PDF).
    - Map the PDF values back to intensity levels (0-255) for the equalized image.
    - Apply the mapping to the original image to obtain the equalized image.
    - Plot the histograms of both the original and equalized images.
    - The function should return the equalized image.

Evaluation:

Anytime after CV mid-term exam.

Maximum Points: 10