

# Homework #2: Image Enhancement in the Spatial Domain

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*Assigned: 16.04.2024 Due: 30.04.2024*

## 1 Objective

The purpose of this homework is to make you practice image enhancement techniques in the spatial domain, including point processing operations, histogram processing, and spatial filtering. Specifically, you will need the techniques discussed in Lectures 4 through 6.

## 2 Before Starting

**Programming Language:** You are free to implement your code in MATLAB, Octave, or Python. But state which one and which version you used in your report.

**Data:** You are given the necessary image files in the *images.zip* file. Download, unzip, and include that directory in your workspace.

**Report:** In addition to your implementation, you will write a report using the given report template. Convert it to pdf format before submitting.

## 3 Assignment

In the provided images folder, you will find six different images labeled A through F. Each image has two versions: original and modified, which are indicated by the file names. The images with the “\_original” extension are the source images that have not been processed. One of the spatial domain image enhancement techniques (point processing, histogram processing, or spatial filtering) has been applied to the relevant source images to produce the images with the “\_modified” extension. Your task is to determine which operation was applied to obtain the modified images and create a script that can reproduce the results from the original image.

### Notes:

- Each image is modified using a single operation.
- You can analyze the histograms of the images to make your predictions.
- Reproducing the modified images with exact parameters may be difficult for some of the images, but it is still possible. Try to do your best.
- In your report, it is important to explain your methods and the parameters used.

## 4 Submission

- You can do this homework in pairs (or individually).
- Your submission must include all your source codes and your report in pdf format.
- At the top of your source files, write your name, surname, and student ID as a comment.
- Your source code files may have .m, .mlx, .py, or .ipynb extensions.

- Place all your files in a zip archive with the name **HW2\_ID1\_Name1\_Surname1\_ID2\_Name2\_Surname2.zip** and submit through the MS Teams submission module.
- If you have further questions, you can send me an e-mail.

#### 4.1 Late Submission Policy

The deadline for homework submissions is **23:59** on the specified date. For each additional day, a **25% cut-off** will be applied.

### 5 Checklist

- The name and format of your submitted file must be as described above.
- You must use the template for the report. Your report must be in PDF format.
- Do not copy the codes/ideas/text of any others (and from the Internet). You can borrow ideas and use partial codes from elsewhere, in case you give proper citations. Otherwise, you are CHEATING and you will be penalized!

Dr. Zeynep ÇİPİLOĞLU YILDIZ