MIDDLE EAST TECHNICAL UNIVERSITY
NORTHERN CYPRUS CAMPUS

CNG 466 – FUNDAMENTAL IMAGE PROCESSING TECHNIQUES
Assignment 2

Image Restoration and Reconstruction
(Lectures 1-6)

Objectives:

The purpose of this assignment is to familiarize yourselves with the image restoration techniques (including spatial and frequency domain). Due to the hardware malfunction or other problems during image acquisition, there may be some additive or periodic noise patterns in the images. These can be identified and eliminated in spatial/frequency domain. For this assignment you are given images with noise of different types and characteristics. Your job is to investigate the given images in spatial and frequency domains, identify the abnormalities and design filters to eliminate them.

Description:

You are required to identify the type of noise in the images noisy1.png, noisy2.png and noisy3.png, shown in Fig.1 by investigating their spatial and/or frequency domain representations. Your job is to remove the noise present in the images while preserving informative structures like edges and boundaries as much as possible.

Note that full recovery is not possible in some cases due to the information loss. Implement your solution as a MATLAB script named A2_*StudentID.m* which processes the noisy images. After running the script, an image named *recovered1.png, recovered2.png* and *recovered3.png* should be created as the reconstruction.

Grading:

- Investigating spatial and/or frequency domain representations of images using figures, histograms, plots, etc.
- Identification of noise via experiment or visual inspection.
- Identified noise type and explanation.
- Remove the identified noise present in the images.
- Differences between edges of noisy and reconstructed images.
- Explanation (reasons) of used techniques to remove noise and reconstruct images.
- Creating/Writing recovered images.

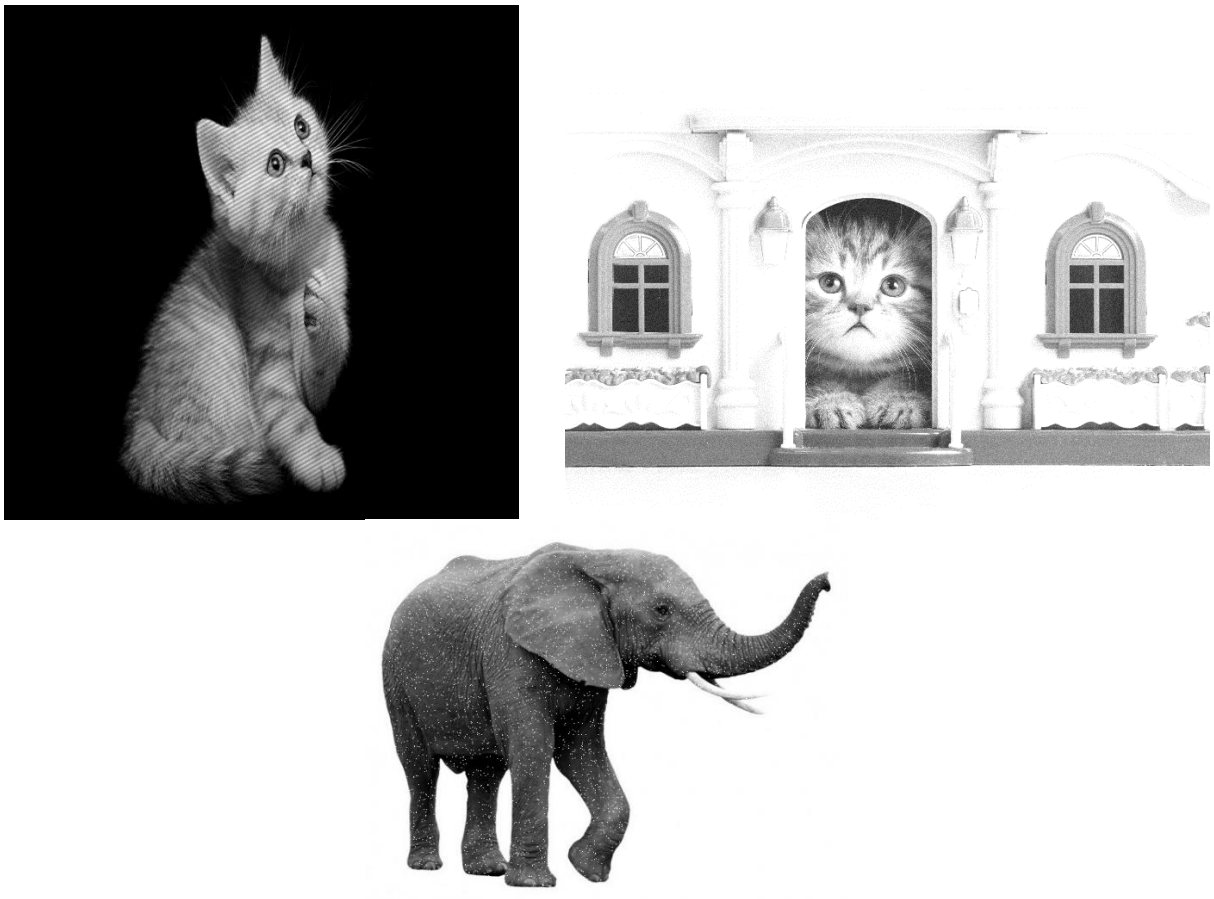

Fig.1: Noisy images: noisy1.png, noisy2.png and noisy3.png

Regulations:

1) **Programming Language:** You must code your program in MATLAB. You must use comments to explain what your code is doing step by step. You are expected make sure your code runs successfully.
2) **Implementation:** In your solutions you are NOT allowed to use any function from Image Processing Toolbox of MATLAB other than imread, imwrite, imshow and imtool.

   If you are not sure which functions belong to image processing toolbox, check from the following link:

   https://www.mathworks.com/help/images/referencelist.html?type=function&s_tid=CRUX_topnav
3) **Submission:** Submit ONLY one .m file. You are allowed to write functions in this .m file.
4) **Deadline:** 12/12/2020 @23:00
5) **Late Submission:** Late submission is not allowed.

6) **Cheating:** Please read carefully cheating policy from the course syllabus.

Please note that failing to do any of the above regulations may result as zero grade.