HOMEWORK ASSIGNMENT

NAZARBAYEV UNIVERSITY | SCHOOL OF SCIENCE AND TECHNOLOGY

PROJECT 3

In this project, you will be processing a noisy video sequence. The project is designed to solidify your understanding of intensity transformations, spatial domain and frequency domain filtering. The problem is also aimed at mastering the programming skills and use of image processing toolbox in Matlab.

DUE DATE

Monday, March 12

METHOD OF DELIVERY

Assignment deliverables should be submitted via Moodle to the course instructor before the due date.

LEVEL OF COLLABORATION ALLOWED

Collaboration is not allowed on this assignment – each student should perform the assignment individually.

ESTIMATED TIME FOR COMPLETION

20 hours

ADDITIONAL SUPPORT

Please contact the course instructor if you need any assistance or have any concerns about this assignment.

GRADING CRITERIA

- 60% will go for the task accomplishment, correct application of image processing concepts, mathematical tools, and MATLAB programming skills.
- 40% are provided by your complexity level choice (15% - Newbie, 25% - Normal, 40% - Expert).

ASSIGNMENT DETAILS

At this of your progression through Digital Image Processing course you have already studied the concepts of intensity transformation, spatial domain filtering, frequency domain filtering. You

should have a good understanding of what noise is. With this you were introduced to the types of noise we usually deal with, as well as various techniques existing to eliminate noise, and thus enhance the image for certain purpose.

In this assignment you are given the short (approximately 16 seconds-long) video with 30 frames per second frame rate. On watching the video, you will understand that it contains one or several types of noise. The number of noise types as well as their complexity depend entirely on the complexity level you have chosen. Project 3 requires you to process the video file and remove as much noise as possible from the video sequence. You are aware that a video is nothing but a sequence of image files. You are required to decompose the video into constituent images to be able to approach each for task accomplishment.

Project deliverables include both original and ***clean*** video files, project describing your problem solving plan and implementation and MATLAB code.

Video files provided are customized personally for each student. So there is no single denoising technique which would suit for two students, please do not try to cheat.

To obtain your video files please come to office 7.402 to teaching assistant Mr. Olzhas Adiyatov and ask him to provide you with one. Assignment will take a long time to accomplish, so come as early as you can and start working soon.

Remember that complexity level contributes 40 percent to your work. Thus, *Noob* level could get maximum 15 out of 40, *Normal* 25 out of 40 and *Expert* full grade out of component, respectively.

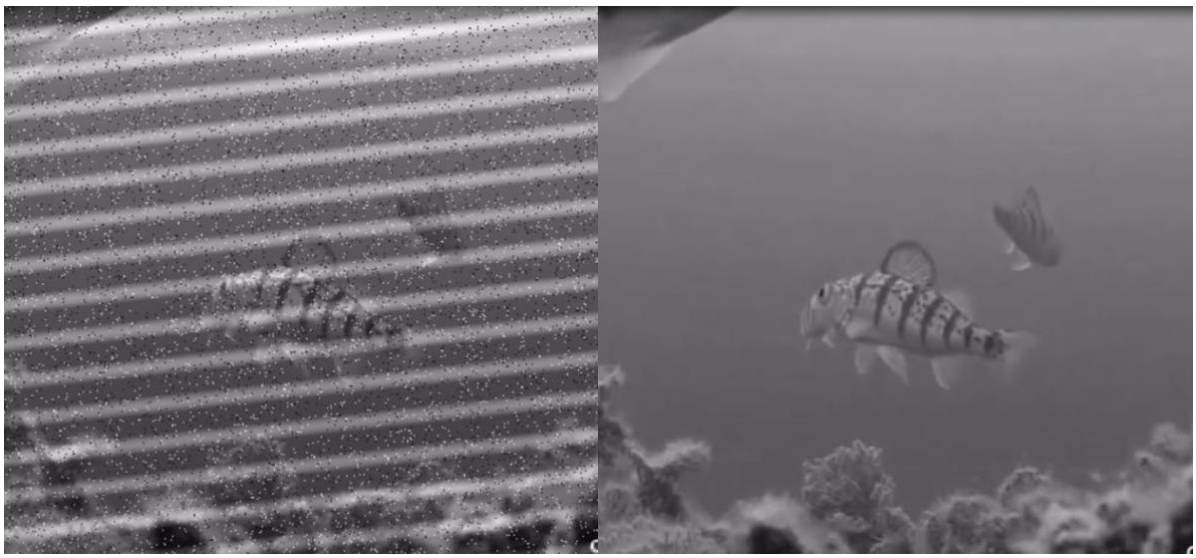

Figure 1. Image with noise (left) and corresponding original no-noise image (right).