CSCI 6527 – Introduction to Computer Vision

Semester: Spring 2023
Dr. Jamaladdin Hasanov

Assignment 2. Digital Image (Pre)Processing.

Total points: 25

Tasks:

Note: there are several images provided – you'll work with one assigned to you in the class.

1. ***Noise removal and reconstruction*** – 10 points

   You have files under *noisy/chemical* folder. Use learned skills and techniques to clean the images from the noise and reconstruct the shapes (lines, letters, etc.).
   Also, add a gaussian noise to your image from the first assignment and try to restore the image.

   Apply the following when applicable:
   a. Using morphology – 2 points
   b. Using spatial filters – 3 points
   c. Using frequency filter – 5 points

2. ***Speckle removal*** – 5 points

   Pick the right technique and approach to clean the speckle noise from the images located in *noisy/speckle* folder.

   Do not use Machine Learning algorithms.

3. ***Visualization of the MRI data*** – 10 points
   Use the dataset provided by the RSNA. You'll use data that is located under *test* folder and use the sample defined by the instructor. You need to write a code that
   - describes the contents and metadata of the files
   - visualizes different layers of the MRI image

Notes on the programming part:

1. Use Python programming language

2. You can use any library you want (like opencv, skimage or something else). No need to implement conversion formulas manually.
3. All the images and source codes shall be submitted to the GitHub repo: https://classroom.github.com/a/Fu2j2m7I
4. Keep images in a separate folder (one folder for original and separate folders for the output of each task).
5. Write a good Readme file that guides the user (instructor).