# Biomedical Image Investigation: Fall 2024

## Homework 5

Due: **10/21 PM 2:10**

In the compressed file you can find three images (*HW5_ima1*, *HW5_ima2, and HW5_ima3*) with different additive noises. Please answer Problem 1 with both ima1 and ima2, and use ima3 to answer Problem 2 if applicable.

**Problem 1**

Read HW5_ima1 and HW5_ima2 and answer the questions below for each image:

(a) Display the **noise** histogram by properly choosing the region of interest. Indicate what the noise PDFs might be and its relevant parameters. (Hint: Use *roipoly* to specify your region of interest).

(b) Apply the most suitable approach addressed in class to suppress the noise in each image. Comment on which filter you find the best if you applied two or more methods.

**BONUS: Problem 2 (ima3)**

Design a Wiener filter to restore an original (unknown) image from the provided image. You will notice that motion blur and additive Gaussian noise are the sources of image degradation, but there is no further information revealed regarding the amount of motion blur and the Gaussian variance. Use a trial-and-error strategy to identify the best Wiener filter. Good luck.