

Multistage Median Filter Exercise

Topic: The multistage median filter is a variation of the standard median filter that is able to retain image details for large windows, where the standard median filter would start degrading the quality of these features. It uses four subfilters that are sensitive to horizontal, vertical, and diagonal directions.

Exercise: Create a Python script file and perform the following tasks:

- Import OpenCV and NumPy libraries.
- Create a function that takes as input an image and the size of the multistage median filter and performs multistage median filtering on the image. Then, it returns the filtered image. It should use 0-padding in order to prevent the creation of black borders in the image. You can add any extra parameters you desire.
- Read an image.
- Corrupt the image with any type of noise you desire.
- Apply multistage median filtering to the noise image.
- Finally, display the noise image alongside the filtered one.