

# CE 490 – Introduction to Digital Image Processing

## MATLAB Exercise #03

Write a MATLAB function/script for the following:

1. Implement your own **averaging filter** function: *myAvgFilt(image,filterSize)*
2. Implement your own **median filter** function: *myMedFilt(image,filterSize)*
3. Read *checker.tif* image. Use your implementation *myAvgFilt()* for filtering.
  - a. Pad 11x11 pixels of “0” around the image using *padarray()*. Filter the zero padded image with an **averaging filter** of size 23x23. Remove padded pixels after filtering.
  - b. Pad 11x11 pixels of “255” around the image using *padarray()*. Filter the padded image with an **averaging filter** of size 23x23. Remove padded pixels after filtering.
  - c. Pad 11x11 pixels of “symmetric” around the image using *padarray()*. Filter the padded image with an **averaging filter** of size 23x23. Remove padded pixels after filtering.

**Show all images (padded, filtered) in the same figure and title them correspondingly. Comment on the results.**

4. Read *hubble\_orig.tif* image. Use your implementation *myAvgFilt()* for filtering.
  - a. Filter the image with an **averaging filter** of size 15x15. **Threshold** the filtered image to obtain a binary image with **thr = 60**.
  - b. Filter the image with an **averaging filter** of size 31x31. **Threshold** the filtered image to obtain a binary image with **thr = 60**.

**Show all images (original, filtered, binary) in the same figure and title them correspondingly. Comment on the results.**

5. Read *board.tif* image.
  - a. **Filter out** the impulse noise using a **median filter** of size 3x3 (use both MATLABs *medfilt2()* and your implementation *myMedFilt()*).
  - b. **Filter out** the impulse noise using a **averaging filter** of size 3x3 (use both MATLABs *conv2()* and your implementation *myAvgFilt()*).

**Show all images in a new figure. Title them accordingly. Comments on the results.**