

“Sviluppo di Modelli Computazionali 3D” (3D Models Generation)

Laboratory 02 – 21/03/2018

Warm-up:

1. Download the source code for this laboratory session at:
http://www.banterle.com/francesco/courses/2018/be_3drec/lab/code_lab_2.zip
2. Extract the zip file in the folder MATLAB in Documents;
3. Add folders and sub-folders in the MATLAB path;
4. Read the file `slice_1016.png` in the folder `code_lab_2/data/mri` using `imread`.
5. Plot the 256 row.

Exercise 1:

1. Implement these functions:
 1. `ImNegative`
 2. `ImGamma`
 3. `ImContrastStretching`
 4. `ImLogarithmicOperator`in the folder `code_lab_2/MATLAB/contrast`

Exercise 2:

1. Play with `histeq` function using as input `mri_contrast.png` image;
NOTE: define a reasonable ROI to avoid high peaks (i.e., low values) in the histogram.
Crop data if needed using the function `imcrop`;
2. Write a function that fits the result of a histogram equalization into a polynomial:
ImContrastFit

MATLAB functions to be used:

1. `hist`: a built-in function that creates and visualizes the histogram of an image;
 2. `histeq`: a built-in function that equalizes an image histogram;
 3. `imshow`: a built-in function that visualizes images;
 4. `imcrop`: a built-in function that crops an image;
 5. `ImNormalize`: a function for the normalization of images;
 6. `polyfit`: a built-in function that fits data into a polynomial;
 7. `polyval`: a built-in function that evaluates polynomials.
3. Test this function by reading the image `mri_contrast.png`:
 1. `img = imread('mri_contrast.png');`
 2. `img = ImNormalize(img);`
 3. `out = ImContrastFit(img);`
 4. `imshow(out);`