"Sviluppo di Modelli Computazionali 3D"
(3D Models Generation)

Laboratory 03 – 28/03/2018

Warm-up:
1. Download the source code for this laboratory session at:
   http://www.banterle.com/francesco/courses/2018/be_3drec/lab/code_lab_3.zip
2. Extract the zip file in the folder MATLAB in Documents;
3. Add folders and sub-folders in the MATLAB path;

Exercise 1:
1. Read the image **mri_noisy_snp.png** in the folder **code_lab_2/data/**;
2. Remove noise using the function **ordfilt2** e **medfilt2**;
3. Display the image without noise and the difference between the input and the denoised image.

Exercise 2:
1. Read the image **mri_noisy.png** in the folder **code_lab_2/data/**;
2. Apply **bilateralFilterWrap** function to reduce the noise playing with sigma_s (> 1) and sigma_r (> 0.01) parameters;
3. Write an iterative function that iteratively applies the bilateral filter until reaches an input given threshold for convergence:

   ImIterativeBilateralFilter

   MATLAB functions to be used:
   1. **bilateralFilterWrap**: it is a wrapper to **bilateralFilter** function by Jiawen Chen;
   2. **Imshow**: a built-in function that visualizes images.

MATLAB Exercise 3:
1. Load mri data; just type "**load mri**" in the MATLAB console;
2. Cast data to double; **double**(name_variable);
3. Normalize data in [0,1];
4. Run **imageSegmenter**;
5. Segment different slices of the volume and store the mask as .png files.