

Computer Vision Course  
Morphological Filter

**Brain CT image:** Give the image *brainCT.png*

1. Read and display image *brainCT.png*
2. Inspect the histogram of the image, and try to find a threshold **T** that separates the bone from the background. Apply the threshold **T** and you will see it is not possible to find a perfect threshold. Thus, the next exercise is to close holes in the bones while trying to keep the overall shape.
3. Experiment with different combinations of opening and closing with different kernel sizes on the binary bone image in step 2. You can also try combinations where the kernel used for opening is different from the kernel used in the closing. Let **Imask** being your best result.
4. Compute the boundary of the bones by use of dilation as follows, and show the boundary image.
  - Dilate **Imask** with a small kernel
  - Subtract **Imask** from the dilated image
5. Compute the boundary of the bones by use of erosion as follows. Show the new boundary image and compare with the image in step 4. Explain the differences between the images in relation to the used morphological operators.
  - Erode **Imask** with a small kernel
  - Subtract eroded image from **Imask**