Exercise 1 – Reading Images (16.October.2017 16h-17h)

<https://github.com/llcaldeira/WuppertalSS>

* This exercise assumes that the recommended software has been installed: FIJI, ROOT and Matlab.
* The images for this exercise are provided in above website.
* Everyone should do the FIJI exercise, but you can choose to start with Matlab or ROOT exercise.

1. Reading Images in Matlab
   1. Start Matlab
   2. Load image Rose\_50dpi.tiff , Rose\_150dpi.tiff, Rose\_300dpi.tiff and Rose\_300dpi\_1000sgl.tiff using function imread (type help imread)
   3. View Image (function imshow)
   4. Check information about the image (function imfinfo).

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| --- | --- | --- | --- | --- |
| Image Name | Size of image (inches) | Number of pixels | Bit information | Data Size |
| Rose\_50dpi | 4.62x6.68 | 231x334 | 8-bit | 75KB |
| Rose\_150dpi | 4.63x6.69 | 694x1003 | 8-bit | 680KB |
| Rose\_300dpi | 4.65x6.67 | 1394x2000 | 8-bit | 2.7MB |
| Rose\_300dpi\_1000sgl | 4.65x6.67 | 1394x2000 | 16-bit | 5.3MB |

* + 1. How does the data size evolve from image to image? Can you explain why?
    2. Can you calculate the dpi (dots per inch) of each image based on the values of the table?
  1. Draw histogram (function hist). One of the images has a different histogram. Why?
  2. Create a script PlotProfile.m that plots a profile of the image.

X=imread(‘Rose\_50dpi.tiff’);

Y=imread(‘Rose\_300dpi\_1000sgl.tiff’);

imshow(X) or imagesc(X), colormap(gray)

imshow(Y) or imagesc(Y), colormap(gray)

infoX=imfinfo(‘Rose\_50dpi.tiff’);

infoY=imfinfo(‘Rose\_300dpi\_1000sgl.tiff’);

hist(double(X(:)),nrbins)

plot(1:size(X,1),X(:,slice))

plot(1:size(X,2),X(slice,:))

1. Reading Images with FIJI (optional)
   1. Start FIJI
   2. Load images: Rose\_50dpi.tiff, Rose\_150dpi.tiff, Rose\_300dpi.tiff, Rose\_300dpi\_1000sgl.tiff
      1. Using the menu File>Open
      2. Using Drag and Drop
   3. Check information about the images (above the image).
   4. Check histograms of the 4 images (Analyze>Histogram).
   5. Check the profile of an image (Select Profile with cursor + Analyze>Plot Profile/Ctrl K).
2. Reading Images in ROOT (optional)
   1. Start ROOT
   2. Write Script LoadImage.C, which:
      1. Loads the image Rose\_50dpi.png (ROOT Class TASImage)
      2. Gets information about image (size).
      3. Displays image (ROOT Class TCanvas)