Images in Matlab

This document gives a step by step procedure on how to import images into Matlab. Then, several examples are given to illustrate matrix decomposition techniques on the imported data.

- Go to
  - http://amath.colorado.edu/computing/Matlab/KristiansStuff/ImageProcess.html for additional information on how to load images into Matlab.
  - http://www.colorado.edu/Directories/CampusTour/earlyyears.html
  - http://amath.colorado.edu/computing/Matlab/Images/pics.html
- Choose your favorite image either of these websites and save it to an appropriate directory by either
  - rightclicking on the image and selecting *Save Image As...* PC's
  - <ctrl>+mouse button and selecting *Save Image As...* Mac's
- Now, open Matlab and change to the directory where you store the image. For instance, if you saved the file in D:, then at the Matlab prompt type

  >> cd d:
- Now load the image in Matlab using the function *imread*. To learn more about this function, type

  >> help imread

  at the Matlab prompt.
- Example 1:

  >> a=imread('cells1.jpg','jpg'); ⟶ Load data into a matrix "a"
  >> imshow(a); or >> image(a); ⟶ Display the image
  >> b=double(a); or >> b=im2double(a); ⟶ Convert data values to type double. You have to do this in order to do any kind of matrix manipulation
  >> [q,r]=qr(b); ⟶ Do a QR decomposition of b
  >> rank(b) ⟶ compute rank of b
- Example 2:

  >> a=imread('everest.jpg','jpg');
  >> imshow(a); or >> image(a);
  >> b=rgb2gray(a); ⟶ Convert rgb colors to grayscale
  >> imshow(b); or >> image(b);
  >> c=double(b); or >> c=im2double(b);
  >> [u,s,v]=svd(c); ⟶ Do a singular value decomposition of c
  >> rank(c) ⟶ compute rank of c
- I highly recommend not using GIF images, I had a hard time making them work