Homework 1: Get started with CV tools

Due in class Thu May 24, 2018

Goal: This assignment will get you up and running with the tools we will use in the class.

1. Install Linux on your system. Ubuntu Linux 18.04 is recommended.

2. Install GNU Octave on your system.

3. Download the latest OpenCV source code release (version 3.4.1 as of May 2018) from `https://opencv.org/releases.html`.

4. Follow the instructions at OpenCV.org to install from source using cmake. Note: I like to keep multiple versions of OpenCV around for different projects. You can do this with a cmake command such as

   ```
   % unzip ~/opencv-3.4.1.zip
   % cd opencv-3.4.1
   % mkdir build
   % cd build
   % cmake -Wno-dev -D CMAKE_BUILD_TYPE=RELEASE \
           -D CMAKE_INSTALL_PREFIX=/usr/local/opencv-3.4.1 \
           -D WITH_QT=true -D WITH_OPENGL=true ..
   ```

   Note that if you have an NVidia graphics card, you'll probably want to install CUDA before OpenCV to get the benefit of all the fast GPGPU algorithms for CUDA.

5. Write a simple program using cmake that uses the HighGUI OpenCV library to read an image from the disk into a `Mat` object and display the image in a HighGUI window. You'll have to figure out how to write a cmake file and how to get cmake to find your OpenCV 3.4.1 installation.

6. Write a simple script in Octave that loads the same image from disk and displays it in a figure.

7. Demonstrate that you have completed the assignment in class on the due date.

By the way, please don't use the famous "Lena" image as a test image. This is an image from Playboy Magazine, and (in Matt's opinion) is symbolic of male oppression and disrespect toward women in society and in the IT industry.