OpenCV

<https://github.com/opencv/opencv-python>

A Python script to make you feel like a Hollywood detective in a crime show. This script uses OpenCV and a deep neural network to examine an image pixel by pixel and upscale it four times. In my testing, this unfortunately does not make an image clearer.

I am also using OpenCV to extract license plates from dashcam footage for my senior project.

Started in 1999 at Intel, OpenCV was Gary Bradsky’s solution to computer vision problems. In 2005, OpenCV was used on the winning vehicle in the DARPA Grand Challenge (an autonomous vehicle race). Today, OpenCV supports a wide array of algorithms related to computer vision and machine learning.

OpenCV’s core functions allow such things as:

* Displaying and saving images/videos
* Controlling mouse events
* Pixel editing
* Geometric transformations
* And many more…

Some of my most used functions are:

* cvtColor(image, ColorCode)
  + Convert an image to a different color space (RGB, CMYK, etc.)
* findContours(image, mode, method)
  + Used for finding the border of something (in my case, license plates)
* Canny(image, threshold1, threshold2)
  + Another method of edge detection in images
* Imread(image, flag)
  + Simply reads in an array representing an image
* Imwrite(filename, image)
  + Writes that array to an image file
* adaptiveThreshold(source, maxVal, adaptiveMethod, thresholdType, blocksize, constant)
  + a method of image thresholding which calculates a threshold for multiple localized sections (used with difficult lighting situations)
* fastNlMeansDenoising(image)
  + provides image de-noising using a Non-local Means Denoising Algorithm
* upsample(image)
  + uses the 'dnn\_superres' interface to upscale an image via pre-trained neural networks