

John B. Smith
ABC Insurance Company
1234 Main Street
Richmond, VA 23230

Re: Doe v Jones, C.D.C. Orleans P

Dear John,

This is a sample of a letter, prepared to version 4.2. If this were an actual letter, this is something interesting that is protected by the

Congress shall make no law respecting free exercise thereof; or abridging the freedom people peaceably to assemble, and to petition

4.3 ACCESSING AND MANIPULATING PIXELS

On Line 14 we manipulate the top-left pixel in the image, which is located at coordinate (0,0) and set it to have a value of (0, 0, 255). If we were reading this pixel value in RGB format, we would have a value of 0 for red, 0 for green, and 255 for blue, thus making it a pure blue color.

However, as we mentioned above, we need to take special care when working with OpenCV. Our pixels are actually stored in BGR format, not RGB format.

We actually read this pixel as 255 for red, 0 for green, and 0 for blue, making it a red color, not a blue color,

After setting the top-left pixel to have a red color on Line 14, we then grab the pixel value and print it back to console on Lines 15 and 16, just to demonstrate that we have indeed successfully changed the color of the pixel.

Accessing and setting a single pixel value is simple enough, but what if we wanted to use NumPy's array slicing capabilities to access larger rectangular portions of the image? The code below demonstrates how we can do this:

```
17 # Grab a 100x100 pixel region of the image
x = img[0:100, 0:100]

# Print the shape of the region
print('Shape of the region: %s' % x.shape)

# Print the top-left pixel value
print('Top-left pixel value: %s' % x[0,0])
```

On line 17 we grab a 100 x 100 pixel region of the image. In fact, this is the top-left corner of the image! In order to grab chunks of an image, NumPy expects we provide four

1. INTRODUCTION

In the running world, there is growing demand for the software systems to recognize characters in computer system when information is scanned through paper documents as we know that we have number of newspapers and books which are in printed format related to different subjects. These days there is a huge demand in “storing the information available in these paper documents in to a computer storage disk and then later reusing this information by searching process”. One simple way to store information in these paper documents in to computer system is to first scan the documents and then store them as IMAGES. But to reuse this information it is very difficult to read the individual contents and searching the contents form these documents line-by-line and word-by-word. The reason for this difficulty is the font characteristics of the characters in paper documents are different to font of the characters in computer system. As a result, computer is unable to recognize the characters while reading them. This concept of storing the contents of paper documents in computer storage place and then reading and searching the content is called DOCUMENT PROCESSING. Sometimes in this document processing we need to process the information that is related to languages other than the English in the world. For this document processing we need a software system called **CHARACTER RECOGNITION SYSTEM**. This process is also called DOCUMENT IMAGE ANALYSIS (DIA).

Thus our need is to develop character recognition software system to perform Document Image Analysis which transforms documents in paper format to electronic format. For this process there are various techniques in the world. Among all those techniques we have