Optical Mark Recognition

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INTRODUCTION:

As humans are continuously and rigorously searching for new innovative ways to make things go faster and more accurate, many sciences have appeared in the last few decades and gone really strong in the past few years. Image processing, machine learning, deep learning and the science of neural networks including giving machine the ability to see in computer vision are all under the terminology "Artificial Intelligence" or AI for short.

Image processing techniques has enabled us the humans to simulate a part of our own intelligence to make our life easier and faster. Optical mark recognition or OMR for short are systems that was generated with the aid of image processing, the art of detecting objects is interesting in many ways, and we are going to discuss the details of building one of them. The tasks that appears really difficult and time consuming to humans are now faster and more accurate thanks to machines. You are one tap away!

Purpose and intended Audience:

The two systems created (which share the same core) are built to solve the same problem but in slightly different ways, the purpose of an OMR system in general is to detect or recognize marks in the image without human interference. The two systems built purpose is to auto correct bubble sheets, one system corrects up to 150 questions and the other up to 200 questions, we will discuss the differences, why there is a 150 model and the disadvantages of having too many questions.
The users of the system are usually teachers and professors in schools and universities who value their time the most.

OMR in Image Processing:

The problems that need image processing or computer vision in general has been around since forever, but neither computational power nor data were available back then. Now with the massive availability of data and the massive computer station power offered with a quite a few money forced computer scientist to reconsider or rethink of better solution for this kind of problems.

Basically, any tasks done on image can be classified as an image processing task, and usually image processing can be a part of a much greater task like computer vision. So, image processing is the preprocessing step in a

computer vision system. Computer vision usually relies on neural networks which are intended to solve a bigger problem than manipulating the number of pixels on image!

The problem to be solved here luckily is an image processing instead of computer vision, which make it look simpler. But in reality when faced with a real world problem, nothing is so simple.

Mechanisms of an OMR system:

So, now what is the mechanisms of an image processing or specifically an OMR systems really are? And how do these things work? To answer this question, we need to understand what image is and how we can make computer understand it.

Images are nothing but pixels values, it can be one-channeled image (gray) or colored image with 3 channels representing the depth of this image. Researchers has found thousands of ways to manipulate this number and come with something useful. The computer could understand an image if we offered it the right kind of algorithm to trach how those changes in the pixel values are made.

Now we can discuss the mechanisms of an OMR system, as discussed in the section above, the OMR system adopts a sequential manner of steps and tricks to successfully understand an image. Going from converting our image to

one channel instead of 3 for example to recognize edges and even shapes in image and therefore, applying calculations in these shapes to finally get us something we can make use of.