Machine Learning and Image Processing with Python 3.X

by

ALI RASSOLIE

ali.rassolie@gmail.com

Rassolie Technologies

*INTRODUCTION*

It is of importance to choose what the aim of the investigation is. Without such aims, it is difficult to navigate through the waters of machine learning and image processing. As a result of this factor, one must be sought. Indeed, with the knowledge acquired, development of an autonomous radio-controlled automobile will be initialized.

*IMAGE PROECESSING*

*Terminology*

***Binary Images***

In essence, the pixels of an image can be converted to binary numbers, whereby they assume one of the two digit-values. This presents feasible applicability whereby the to values can be easily analyzed. This can be likened to a matrix of solely binary values, where a positive value presents a black pixel, which in turn forms images. Furthermore, this may also explain why some 3D-modelling images have more colors.

***Centroids***

Based upon Wikipedia, centroids, when geometry is considered, are the intersection of the three medians of the triangles (note that this median is linked to the opposite vertex). Furthermore, upon further analysis, it seems that finding a centroid involves the vertices of the geometric figure. However in what way this is can be discussed. Firstly, by merely considering drawing a straight line with the vertex in question. An issue which arises here is where this line should be drawn to. In Figure 1 below, it seems that there is nothing specific with the second point of the line. On the other hand, the figure evinces the involvement of the vertex in the centroid. The use of a centroid in this context can be considered as pertinently obvious.

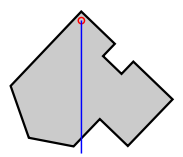


Figure 1

***Heuristic Technique***

Based upon Wikipedia, is any approach to problem solving, learning and discovery which employs a method which is not guaranteed to be optimal.

*MACHINE LEARNING*

Indeed, machine learning can be employed in order to render image processing possible. By presenting data which ascertain and present propitious alternatively positive characteristics, in addition to data which does not, the computer can, based upon this data, form and structure its own conditions for processing images. This will be important for the next step of permitting a radio-controlled car to drive itself, without any manual input.

*Python and Machine Learning*

For the purpose of this investigation, the python language will be employed; whether the choice of programming language is a wise one will be asserted later. At current, no knowledge as to how machine learning and image processing will be combined.

When image processing is considered, it is essential to understand that the data will be multidimensional, whereby the computer will receive different data corresponding to different characteristics of the specific image. This may be handling alternatively treating, for instance, the color, width, and height of the image.

This multidimensional aspect should be considered when a best path solution is going to be presented. Indeed, some form of machine learning algorithm should be involved; furthermore, it is also possible to assume that such an algorithm may be provided by sklearn.

*Terminology*

***Classification***

To which class does a new observation belong to? Both with regard to machine learning and image processing, the incorporation of mathematical models decomposes the data, whereby it can be ascertained that an averaged model is applied.

*Path*

An image with a distinct path is presented. Continuing, a line which tracks within this path is fed as data. These should be