RESEARCH REVIEW JOURNALS
Volume-03
Issue-12
December -2018

ISSN: 2455-3085 (Online)
RESEARCH REVIEW International Journal of Multidisciplinary
www.rrjournals.com [UGC Listed Journal]

Object recognition using fuzzy logic

Guddi Singh

Assistant Professor, Department of Computer Science, Kalinga University, Naya Raipur, Chhattisgarh (India)

ARTICLE DETAILS

Article History
Published Online: 10 December 2018

Keywords
Object recognition, Fuzzy Logic, K-means Algorithm, Content Based Image Retrieval, vectors

ABSTRACT

Object acknowledgment can be seen as a piece of a PC vision framework in which the picture examples will be changed over into an element space and thusly this will be changed into the characterization of different items to be distinguished. Question acknowledgment requires an earlier information of the protest depiction. Commonly these portrayals incorporate shape, surface, shading, and size of the event of such protests in a picture. For identifying image different approaches are followed such as similarity based approach and discontinuity approach. Since these approaches does not give better results hence we have applied Fuzzy logic-K means for identifying different objects in an image. The model accuracy is tested on MATLAB.

1. Introduction

The issue of protest acknowledgment can be seen as a piece of a PC vision framework. In which the picture examples will be changed over into an element space and thus this will be changed into the characterization or choice space containing the prototypical meaning of the different items to be distinguished. Setting finding and picture understanding is the accompanying stage. The question acknowledgment issue can be separated into two fundamental squares: low level and abnormal state vision. The low level vision undertaking can be viewed as to disengage s and locales from the given picture and likewise removing other trademark highlights from a picture. The abnormal state vision implies the understanding of these items or highlights in the casing of a reference scene. At the end of the day the undertaking of question acknowledgment is to discover and mark different parts of the two dimensional picture of the scene. To achieve the protest acknowledgment undertaking one should first build up the models portrayal of the question which must be perceived. This suggests the question acknowledgment requires an earlier learning of the protest depiction. Regularly these depictions incorporate shape, surface, shading, and size and setting learning of the event of such questions in a scene. An advanced picture may contain a few unmistakable sorts of data which can be translated in totally particular ways. The most rudimentary data originates from the deliberate pixel esteems without its significance. The regular ways to deal with protest acknowledgment depend totally on neighborhood administrators that investigate the deliberate light forces of the picture. The genuine s are characterized by their geometric and semantic qualities and additionally by their factual properties. In this manner the traditional strategies may neglect to perceive the items legitimately. For instance, contingent upon the discretionary limit settings, edge locator strategies will either deliver such a significant number of edges that the pertinent data will be exceptionally hard to be deciphered or now and then concentrate not very many from the every single important limit. In related work we will introduce a few procedures of picture division and limit location.

2. Methodology of the proposed work

2.1. Feature Vectors

i. Signature: It is used for representation of boundary. It is a boundary distance vector from the centroid of each component.

ii. Shape number: It is used to represent a boundary by a connected sequence of straight line and segments of specified length and direction.

iii. Histogram of each component.

iv. Statistical properties: In this we have find the Mean and Variance of the objects for the physical interpretation of the objects or components.

v. General properties: General properties are Area, Perimeter and compactness.

2.2. Working

i. Resize the image in an appropriate size of (255X256).
ii. Segment image by K-means.
iii. Merging the segment having the same color.
iv. Find out region and eliminating very small regions.
v. Calculation of features vectors.

3. Related work

3.1. Image Segmentation and Edge Detection

In computer vision, division alludes to the way toward dividing a computerized picture into different sections (sets of pixels, otherwise called super pixels). The objective of division is to rearrange and additionally change the portrayal of a picture into something that is more significant and less demanding to break down. Picture division is commonly used to find items and limits (lines, bends, and so forth.) in pictures [1]. All the more unequivocally, picture division is the way toward doling out a name to each pixel in a picture to such an extent that pixels with a similar mark share certain visual attributes. Edge recognition is a noteworthy advance for perceiving objects from a given scene. The order phase of the protest acknowledgment relies upon the nature of edge portrayal arrange. An assortment of edge recognition calculations exist [2] and [3], e.g. dynamic programming,

piecewise straight polygonal estimation of an associated edge list, Hough change [2]. Various grouping procedures have been utilized for edge discovery. Among these the fluffy Clustering strategies are turned out to be profoundly fruitful [4] and [5], for edge identification as well as for district division too. These strategies are generally in view of the minimization of target utilitarian [4], where the goal useful is the weighted aggregate of square (WGSS) of the separations (Euclidean for direct bunches) from a deliberate pixel to the computed model or centroid of the specific class. Subsequently the kind of identification is subject to the sort of model. In the event that the model is been a straight line, at that point the calculations have a tendency to identify the lines in the information. The sort of separations can likewise be changed to fit into the state of groups. An assortment of separations and in addition direct models have been proposed. A broadened type of this calculation can likewise be used to perceive planes.

3.2. Fuzzy K-Means

The clusters delivered by the k-implies method are once in a while called "hard" or "fresh" groups, since any component vector x either is or isn't an individual from a specific bunch. This is as opposed to "delicate" or "fluffy" bunches, in which an element vector x can have a level of participation in each group.

3.3. Algorithm

The *k*-means algorithm assigns each point to the cluster whose center (also called centroid) is nearest. The center is the average of all the points in the cluster — that is, its coordinates are the arithmetic mean for each dimension separately over all the points in the cluster.

Example: The data set has three dimensions and the cluster has two points: $X = (x_1, x2, x3)$ and $Y = (y_1, y2, y3)$. Then the centroid Z becomes $Z = (z_1, z2, z3)$, where $z_1 = \frac{x_1 + y_1}{2}$, $z_2 = \frac{x_2 + y_2}{2}$ and $z_3 = \frac{x_3 + y_3}{2}$.

The algorithm steps are:

- Select some clusters like*k*.
- Randomly produce k bunches and decide the group focuses, or specifically create k irregular focuses as bunch focuses.
- Assign each point to the closest bunch focus, where "closest" is characterized as for one of the separation measures talked about above.
- Recomputed the new group focuses.
- Repeat the two past strides until the point that some union paradigm is met (generally that the task hasn't changed).

4. Result and Discussion

Figure 4(a): This is Original Image on which we applied the object recognition techniques.

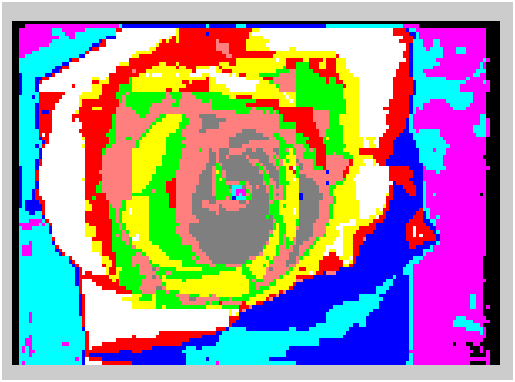

Figure 4(b): This is K-Means Segmented image.

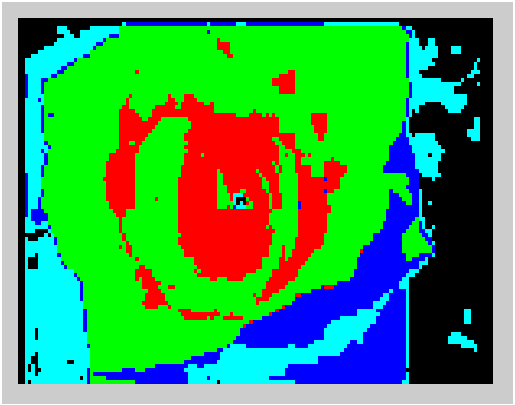

Figure4(c): Merging the segment having the same color.

Figure 4(d): This is Final image which shows the objects in different color.

5. Conclusion

In this paper we have presented techniques for object recognition in an image using fuzzy logic which follow K-means. These object recognition techniques can be applied to any kind of objects in an image. The advantage of this technique retrieves or recognizes number of objects in an image. This technique can be further implemented in advance projects like “Content Based Image Retrieval” (CBIR) etc.

References

1. Tiu Lin and Edwin, Digital Image processing Using Matlab 3rd Edition, 2016.
2. Abhimanyu, "Computational strategies for object recognition," *ACM Computing Surveys*, vol. 34, No.1, March 2017.
3. Linder Swapnil," Theory of edge detection," *Proc. of Royal Soc. London B.* 207, pp.187-217, 2014.
4. Yasir Meri, *Pattern Recognition with fuzzy objective function algorithms*, Plenum Press, NY, 2015.
5. Anil Kumar and Sanjeev Pathak, *Fuzzy models for graph recognition*, JIER, 2017.

