

# Theoretical Model for Holistic Non Unique Clustering {Version 2}

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**Abstract-** In this research investigation, the author has presented a novel method for Holistic Non Unique Clustering.

**Index Terms-** Connected Cluster

## INTRODUCTION

One can refer to a ton of literature on Clustering on the World Wide Web. However, there is very little information regarding Multi Class Classification, i.e., Holistic Non Unique Clustering. In this research paper, the author presents detailed novel ideas regarding Holistic Non Unique Clustering.

**THEORY** (Author's Holistic Non Unique Clustering Model)

1. Firstly, we consider  $m$  number of data points each of  $n$  dimensions each. We wish to holistically cluster these points into Non Unique Clusters. By Non-Unique Cluster, we mean that one or more data points of a cluster can also belong to one or more other clusters, in this context of derivation of Holistic Non Unique Clusters for the given data points.

2. We now find the distances between each of the given data point with each other data point excluding itself. Let these be denoted by

$$d_{ij} = \underset{\substack{i \neq j \\ i, j=1 \text{ to } m}}{\text{distance}}(i, j)$$

in number.

3. We now find all the ratios

$$k_{ls} = \left( \frac{\underset{\substack{i \neq j \\ i, j=1 \text{ to } m}}{\text{distance}}(i, j)}{\underset{\substack{p \neq q \\ p, q=1 \text{ to } m}}{\text{distance}}(p, q)} \right)$$

with  $i \neq p$  and

$j \neq q$  simultaneously. These will be  $(m^2 - 1)$  in number for each  $d_{ij}$ . Therefore, these will be  $m^2(m^2 - 1)$  in number.

4. We now arrange these  $k_{ls}$  in ascending order.

Let this be a vector  $K_{1 \times (m^2 - m^2)}$ .

5. We now pick any data point, say  $k^{th}$  data point represented by  $k$ , among the  $m$  data points and find its nearest data point (distance is measured as Euclidean Distance), say  $k_{nearest1}$  and find the distance between these two points. We call it  $\text{distance}(k, k_{nearest1})$

6. For each of the  $k_{ls}$ , we now find all the data points that form a Connected Cluster within the distance  $\left\{ \text{distance}(k, k_{nearest1}) \right\}$ . These will be  $m^2(m^2 - 1)$  in number.

7. Similarly, we repeat finding the Clusters for the next nearest data point to the data point  $k$  as detailed in 5 and 6. We keep finding the clusters till the case for the farthest data point to point  $k$ .

8. In this fashion, we can find all the Holistic Non Unique Clusters.

9. We now rank the bestness of each of the thusly found cluster in the decreasing order of their Clustering Error. The Clustering Error definition used can be the standard literature for Clustering Error for a Connected Cluster.

## REFERENCES

[1] [http://vixra.org/author/ramesh\\_chandra\\_bagadi](http://vixra.org/author/ramesh_chandra_bagadi)

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