AN ANALYSIS ON IMAGE RETRIEVAL BASED ON RANKING USING MACHINE LEARNING ALGORITHM

MRS.DEEPIKA.S[1] , PRIYADHARSHINI.P[2]

MRS.S. DEEPIKA

ASSISTANT PROFESSOR, DEPARTMENT OF B.COM BUSINESS ANALYTICS,

PSGR KRISHNAMMAL COLLEGE FOR WOMEN, COIMBATORE, INDIA.

deepika@psgrkcw.ac.in

P. PRIYADHARSHINI

UG SCHOLAR, B.COM (BUSINESS ANALYTICS),

PSGR KRISHNAMMAL COLLEGE FOR WOMEN, COIMBATORE, INDIA

priyapalanikumar2000@gmail.com

ABSTRACT :
The paper mainly aims about the Image retrieval based on ranking which is already ranked using machine learning algorithm. Supervised learning of semantic searching is a method that allows users to draw generic search queries and return similar drawn images, giving more user control over their search content. The current approach makes full use of the semantics in query and the top ranked images of the initial results. Linear regression is used to analyse the dependent and independent variable of the attributes and to find the accuracy score of the attributes.

KEY WORDS : machine learning, linear regression, supervised learning, accuracy score, violin plot

I. INTRODUCTION

This paper is about the analysis made on Image retrieval dataset based on ranking using machine learning algorithm based on supervised learning. It is used for image processing, prediction, regression etc. The dataset has been imported to jupyter notebook. Python is an interpreted high-level general purpose language and it's a object oriented programming language. Linear regression is used to find the accuracy score of the attributes which is rank and feedback and to find the dependent variable value based on a given independent variable and violin plot is used to find the highest and lowest probability of the attributes.
In Content-based Image Retrieval (CBIR), accurately ranking the returned images is of paramount importance, since users consider mostly the topmost results. The typical ranking strategy used by many CBIR systems is to employ image content descriptors, so that returned images that are most similar to the query image are placed higher in the rank. While this strategy is well accepted and widely used, improved results may be obtained by combining multiple image descriptors [5].

II. REVIEW OF LITERATURE

CBIR systems are designed to retrieve images similar to a user-defined specification or pattern (e.g., shape sketch, image example). Their goal is to support image retrieval based on content properties (e.g., shape, color, texture), encoded into feature vectors [1].
The first fine-tuning method requires much manual work to collect images and mark them as specific architectural categories, which improves the accuracy of retrieval. However, its formula is closer to the image classification rather than the expected attributes of instance retrieval. Another method uses a geotagged image database to perform training by separating matching and non-matching pairs, and directly optimizes the similarity metric to be applied in the final task. In this process, metric learning plays a key role [2].
On those contexts, Content-Based Image Retrieval (CBIR, [3]), can be very helpful, since it forsakes the need of keywords or other textual metadata. Often, it consists of retrieving the most similar images to a given query image, a form of query-by-example that makes concrete the intuition of the famous proverb: "a picture is worth a thousand words". However, satisfying the user needs involves answering the conceptual query which is represented by the sample image – an open research issue.
Significant research is being performed in this area to enhance the performance of automatic image annotation, but the difference in visual perception can mislead the retrieval process. Content-based image retrieval (CBIR) is a framework that can overcome the abovementioned problems as it is based on the visual analysis of contents that are part of the query image. To provide a query image as an input is the main requirement of CBIR and it matches the visual contents of query image with the images that are placed in the archive, and closeness in the visual similarity in terms of image feature vector provides a base to find images with similar contents. In CBIR, low-level visual features (e.g., color, shape, texture, and spatial layout) are computed from the query and matching of these features is performed to sort the output [4].

III. METHODOLOGY

A. Seaborn library

Seaborn library is a python visualization library based on matplotlib and it provides high level interface for plotting and visualising graphs. It a library that used to visualize random distributions. It helps to visualise the data in a understandable manner.

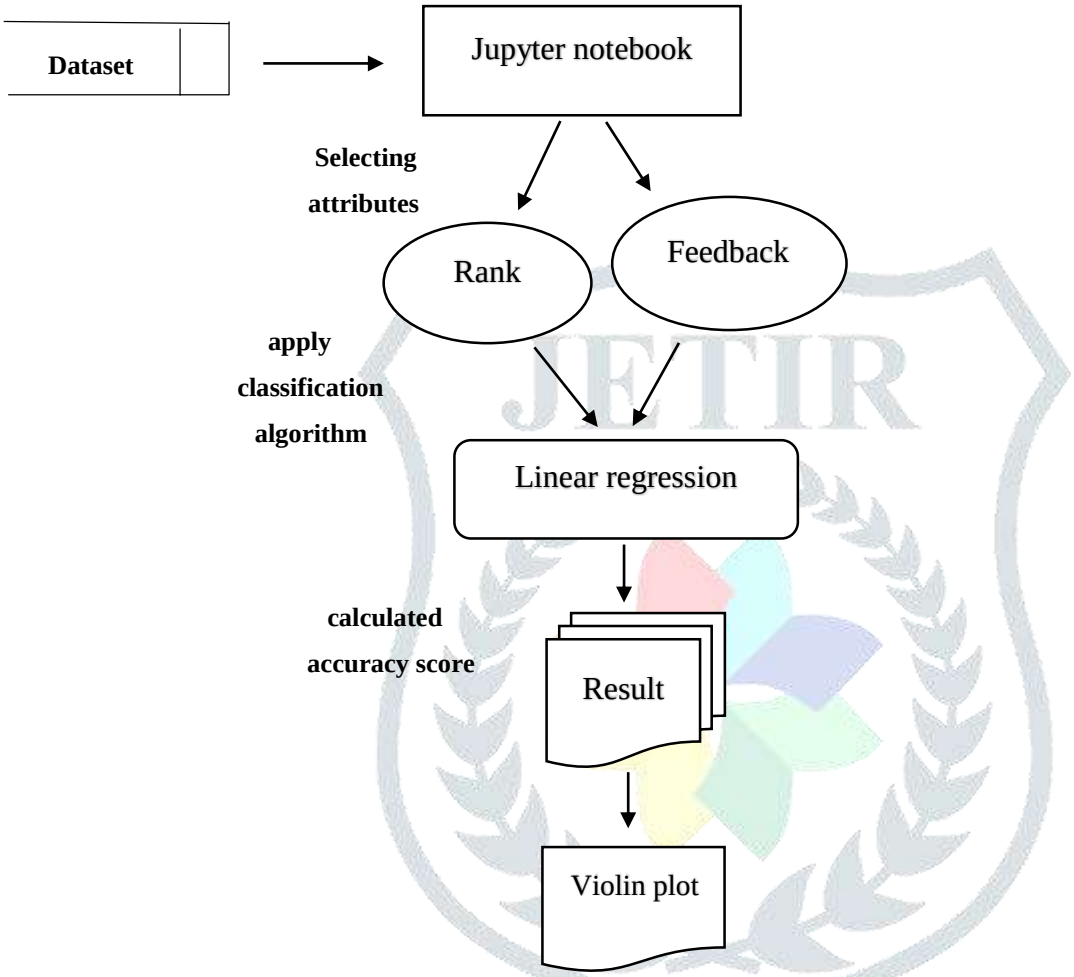
B. Linear regression

Linear regression is used to find the accuracy score of the attributes which is rank and feedback and to find the dependent variable value based on a given independent variable. Linear regression is next step up after correlation. It's a simplest form of regression. It is mostly used for predictive analysis.

C. Violin plot

A violin plot plays a important role like box and whisker plot. Violin plot is used to find the highest probability and lowest probability of the attributes. There will be a grey line which is called kernel density estimation. It means the widest part means having highest probability and thinner section means lowest probability.

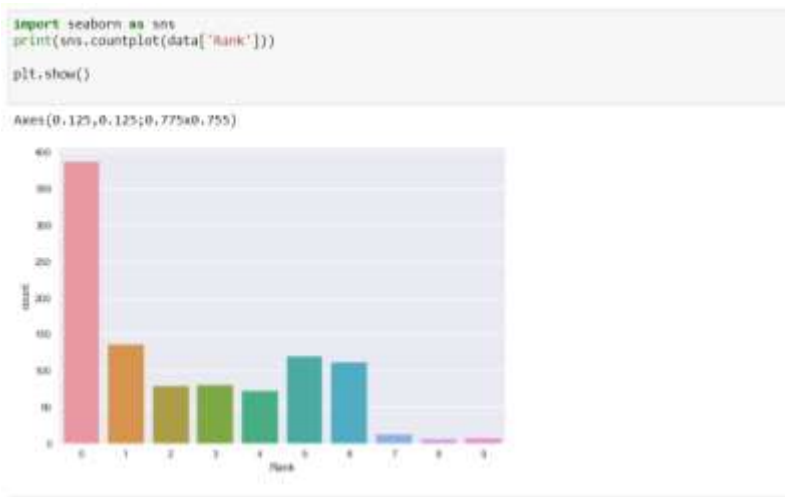
Fig 1: FLOW CHART OF THE PROCESS



IV. RESULT

- **SEABORN GRAPH**

Fig 2



The above graph shows the plotting for rank attribute. It shows that for more than 350 to 400 dataset has been ranked 0 and 100 to 150 was ranked number 1.

- **LINEAR REGRESSION**

Fig 3

The above graph shows the defining the data to work with the inputs (regressors, x) and output (predictor, y) should be arrays (the instances of class numpy, ndarray) or similar objects. This is the simplest way of providing data for regression. Creating a linear regression model and fitting it using the existing data then the next statement is to start using the model. call.fit() is used for calling the model. Then apply .predict() function that will pass the regressor as the argument and get the corresponding predicted response. plotting a graph by using x,y which is defined earlier and choose colour red and display the graph.

Fig 4

The fig 4 shows to print the linear regression co efficient and linear regression intercept by using the above coding. importing numpy as np. randint() It returns an array of specified shape and fills it with random integers from low (inclusive) to high (exclusive), i.e. in the interval [low, high). creating y_pred, y_test. Then display the np sum of y_pred, y_test. Importing the accuracy_score and using that to finding the accuracy score for y_pred, y_test.

- **VIOLIN PLOT**

Fig 5

The above graph shows that the attributes which are ranked range 6 will have highest probability of feedback range 4. The gray line represents kernel density estimation. The wider sections means it shows highest probability and the skinner section means lowest probability.

FINDINGS:

- This analysis is made on image retrieval dataset based on ranking using linear regression to find the accuracy score of the attributes.
- Visualised using seaborn library. It shows that for more than 350 to 400 dataset has been ranked 0 and 100 to 150 was ranked number 1.
- Using linear regression predicted the accuracy score 1.0 of the attributes.
- Visualised using violin plot it shows that the attributes which are ranked range 6 will have highest probability of feedback range 4.

V. CONCLUSION

This paper shows the analysis made on the image retrieval dataset. Linear regression is used to analyse the dependent and independent variable of the attributes and to find the accuracy score of the attributes. an effective supervised retrieval approach with semantic-ranking is implemented. Predicted the accuracy score of the attributes using linear regression. Highest probability was predicted by using violin plot.

FURTHER WORK:

It is suggested that the method of solution can be further extended to K-means clustering algorithm for grouping the attributes based on similarity for attributes like search visits and image feature also, it is suggested in logistic regression.

REFERENCES

[1] Adriano Veloso Dep. of Computer Science Fed. Univ. Minas Gerais Belo Horizonte, MG, Brazil adrianov@dcc.ufmg.br
[2] Arandjelovic, R.; Gronat, P.; Torii, A.; Pajdla, T.; Sivic, J. NetVLAD: CNN Architecture for Weakly Supervised Place Recognition. IEEE Trans. Pattern Anal. Mach. Intell. 2018, 40, 1437–1451. [CrossRef] [PubMed]
[3] D. Ritendra, J. Dhiraj, L. Jia, and Z. W. James. Image retrieval: Ideas, influences, and trends of the new age. ACM Comput. Surv., 40(2):1–60, April 2008.
[4] D. Zhang, M. M. Islam, and G. Lu, "A review on automatic image annotation techniques," Pattern Recognition, vol. 45, no. 1, pp. 346–362, 2012.
[5] Fabio F. Faria Institute of Computing University of Campinas Campinas, SP, Brazil fabiof@lis.ic.unicamp.br