

Gender Voice Recognition with Classification approach using Random Forest and Decision Tree Algorithms

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Abstract— Gender identification is one of the major problems of the speech processing. Gender tracking from aural data like median, frequency, and pitch. Machine learning provides auspicious results for the problem of classification in all domains. There are a few standards to work on to appraise the algorithms. Our model comparisons algorithm for appraising different learning algorithms is based on different metrics for classifying gender and aural data. An important parameter in evaluating any algorithms is their performance. The degree of variability should be low for classification set of problems; means the accuracy rate should be pretty high. The position and gender of the person became pretty important in financial markets by the form of AdSense. With this model comparisons algorithm, we tried different ML algorithms and came up with the best fit for the gender classification of aural data.

Index Terms—Gender identification, Voice Recognition, Random Forest Algorithm, Decision Tree Algorithm.

I. INTRODUCTION

Finding someone's gender based on their voice is an easy task. In the real world, the difference between male and female voices can easily be identified by human ear in first couple of words. Its most common communication in the world. The voice is full of many linguistic features. These voice features are considered a voice print to recognize [14] the speaker's sex. Voice recordings are considered as input to the system, which is then the system's process for detecting voice features [1]. However, programming to do this becomes very difficult.

Manuscript revised on April 30, 2020 and published on May 10, 2020
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This document describes the design of a computer program to illustrate the analysis of words and words that determine gender [2]. Test the input and compare it with the trained model, perform the calculations according to the algorithm used and give the same result i.e. male or female.

II. CLASSIFICATION ALGORITHMS DESCRIPTION

A. Random Forest Algorithm

Random Forest is a supervised learning method used for classification and regression. It is mainly used to collect news of unsafe separation. Each tree provides the cohesion of that feature. The forest chooses a section with the most votes in a particular ward. It is a spherical study of the classification [3] [13], registration and other functions, which works by constructing multiple decision trees during training and extracting a game path (categorization) or mean prediction (repositioning) of individual trees.

B. Decision Tree Algorithm

Decision Tree is also a supervised machine learning technique for both the predictions as well as the classification in machine learning. Tree decisions are trees that are categorized according to feature values. Each location in the decision tree represents a specific element in the image, and each branch represents a value that can be considered a negative space. The tree learning curve, used in data mining and machine learning, uses the decision tree as a model for mapping an object to a specific object to draw conclusions about the value of an object.

C. Logistic Regression Algorithm

Logistic Regression is also for classification problems; is a prediction-based algorithm for analysis and is based on the assumption of probability. Logistic Regression uses a very expensive function, this cost function can be defined as a 'Sigmoid function' or also known as a 'function logistic' instead of a linear function. Other examples of problems with spam emails or not online spam Scanning or Not Fraud, Tumor Malignant or Benign.

D. Support Vector Machine

SVM is also a good for both classification and regression challenges. However, SVM usage is widely in separation problems. In this algorithm, we plot each data element as a point in the n-dimensional space (where the value of n is the

number of elements) for the value of each element that is the sum of a particular combination.

E. Naïve Bayes Algorithm

The Naive Bayes algorithm works by making assumptions of conditional independence in the training data. The complexity of the Bayesian algorithm above needs to be minimized, in order to work. This greatly reduces the severity of the aforementioned problem to only 2n. The assumption of conditional freedom means that, given a random distribution of X, Y and Z, we say that X is an independent of the terms Y by given Z, and only if the probability distribution of the control X is independent of the value of Y by given Z.

F. KNN Algorithm

K-nearest neighbor algorithm can also be useful for classification and prediction problems. Algorithms around K-used (KNN) use 'similarity factor' to estimate the positions of new data points which means that the new data point will be assumed and assigned a value based on nearest training set points. However, main usage is for classification problems in the industry.

III. METHODOLOGY

Here is the problem of machine partitioning when there is data to test for voice sex. This data was created to identify the voice as gent or lady, based on voice and speech properties [10]. Our database consists of 3,168 recorded voice models, collected from gent and lady speakers [16]. The other columns in the dataset are mentioned frequency, standard deviation, deception, Kurtosis, spectral penetration, visual acuity [11]. Supported data is about a voice recovery that was updated later last month from Kaggle.com to get a better accurate result. In this paper we have used Classified Algorithms such as KNN, Logistic Regression [12], Tree Decision, SVM[9], Naïve Bayes Algorithms [15]. The data set is mainly categorized as trained data and test data. Thus, the main focus in dividing the data into two parts is dependent on the signals i.e. X and output factor i.e. Y. An efficient system achieves 89% accuracy in the test set.

We took the Voice gender detection dataset and did the pre-processing after that data cleaning is done [4] [8]. Then used training model and we tested the models. We have applied Classification techniques like Logistic Regression, SVM, random forest, decision tree, KNN and Naive bayes. From this, we have collected the results and finally analysis has done [5] [6] .

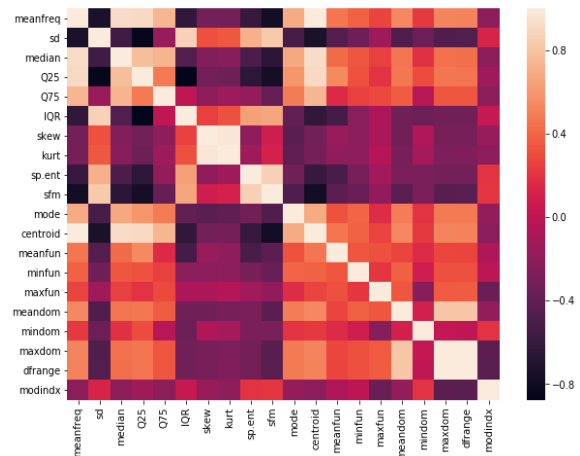


Figure 1 - Correlated Attributes using Heatmap

IV. RESULTS

The test results will be shown below:

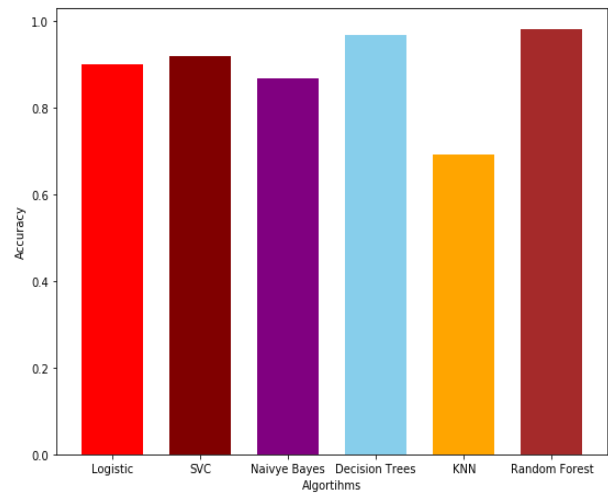


Figure 2 – Bar Graph

Table- I: Performance Comparison Chart of Classification Algorithms-

Algorithm Used	Train data	Test data
Random Forest Algorithm	0.9794	0.9794
Decision Tree Algorithm	0.9668	0.9668
Logistic Regression Algorithm	0.9006	0.9024
Support Vector Machine	0.9179	0.9195
Naive Bayes Algorithm	0.8675	0.8679
KNN Algorithm	0.6924	0.6937

V. CONCLUSION AND FUTURE SCOPE

By studying several algorithms on the given dataset as input in Table- I. Random Forest Algorithm gives the accurate and perfect results when comparing with the other Classification Algorithms. Finally, to identify a voice as male or female based upon acoustic properties of the voice and speech.

In future, the implementation can be done with a voice-based emotion detection system on smart phone platforms. And it can be applied in homes to make it as a smart home, offices as smart office and virtual reality. It may grab the crucial part in all aspects of people's life in the future.

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