

Vocal Classification Machine Learning through Orange

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Abstract: Voice is like the feature in the human body. Every person in this world has the different vocal length. Voice is a specific identification for a human. When someone talk we identify the person even we not see his/her face. Male and female has the different vocal length. Even when someone talk we also know about the emotion like sad, rage and or other emotion of that person. In this study we classify the voice on the base of frequencies that are available in dataset. We use data mining tool that is called orange and use classification algorithm to classify the male and female voice on the base of frequencies. In this paper we also compare the algorithm of classification to check that which algorithm give highest accuracy on this data set for the gender identification.

Keyword: classification, orange, gender voice, random forest, Naïve Bayes, Knn, logistic regression.

1. Introduction

Gender reorganization means to know that which person is that male or female. Gender identification is most important nowadays because some of the people has the same name in same company where they work. And when sometime name not identify the person who is this. But if people listen to someone then they can imagine who is talking male or female, even they not seeing each other. Every person in this world has the different vocal length from the other human in the world. Even the animals has the different vocal length and we can identify that which animal sound is that. But in this paper we only use human voice data set to identify that who is that male or female. Human can easily identify that who is talking male or female. Nowadays for the security the companies use the artificial intelligence for the security and they use this for website and the building like camera, motion detector and the voice recorder and many other application and the software to make the place or the online web, application, game and so thing to secure.

Fort this they need artificial intelligence to make this sure to everything is going perfect. For this they also

train the machine to make the difference between the safety and the risk. For this purpose we need to train the machine but the machine is not the natural motion. To train the machine we give the large number of the voice and their frequencies, and make sure that in these frequencies the voice has every emotion like rage, sad and funny like this. The provided frequencies are in the form of number but the voice detector use these number as the voice and machine only know these number as the voice. But the frequencies are changed with the change of emotion. Like if the a male is getting angry then the tone and the emotion is changed of this male and also the vocal length of this person is also changed like some time a person is sad his/her voice is slow, when he/she is angry then sometime his/her voice is louder than the normal voice like this the vocal length is change with emotion and the voice is also show the emotion of the person.

The most significant object for to train the machine to identify the voice of the somebody to make change is female or male. We give the dissimilar frequencies to the machine to learn and mark the change between the vocal lengths. The frequencies of the dissimilar feeling like sad, rage, happy and normal etc.

There are countless application that is custom to recognize the voice. These are used to observation and detect the emotion of the person. There are web based \e-learning, clinical study, entertainment etc. In this study we also know about the artificial intelligence machine learning tool and their techniques of classification. Is classification algorithm make the difference between the different frequencies of the voice and make the difference between the emotions by the class that is present in the data set.

2. Literature review

Artificial intelligence and machine-learning methods are slowly shifting from predefined symbols and features as input to real world signals,

e.g., sounds and videos. A tool that enables fast prototyping of ml models using sound as input can significantly reduce the experimenting time both for experts and non-experts. Such tool can easily build baseline ml models for any sound-related ml task. The baseline models can be later used for comparison with more advanced sound ml approaches [3].

For this study we read many paper about the machine learning classification of the gender identification from the voice. But we not found any paper about the orange tool of machine learning for the classification of the gender identification. However, we found a paper and we get a great inspiration from this paper about our idea to classify the gender on the base of their voice through orange tool. In this paper we classify the human gender male and female on the base of their voice. But in this dataset only the frequencies are provided to train the machine, and also in this study we compare the classification algorithm, which algorithm give the highest accuracy by using the orange machine learning tool.

3. Dataset

Dataset is downloaded from the internet [2]. The dataset has the dissimilar frequencies of the voice with dissimilar reaction and these sentiment are the attributes of the dataset. There are 21 attribute like sad, normal and happy and 3168 instance in this dataset. Every attribute has the different frequencies.

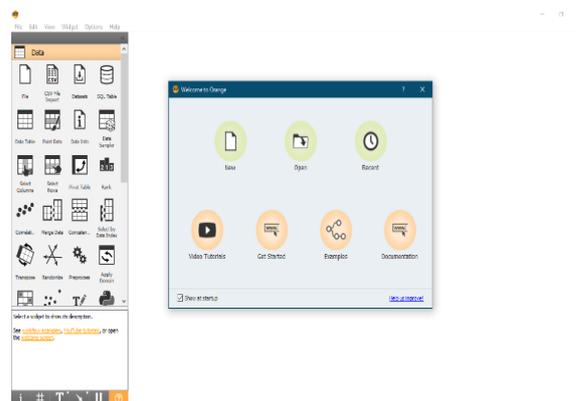
4. Methodology

Orange is one of the data mining tool that are used predict and check the accuracy of the dataset. In this paper orange tool is used for the classification of the gender voice on the bases of the accessible dataset and the results are also related of the classification techniques with is belong to data mining tool.

5. Tools and techniques

5.1. Orange

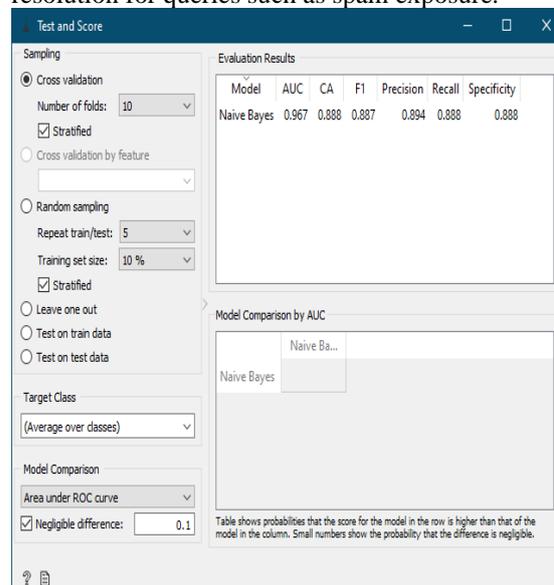
Orange is an open source machine learning and data mining software (written in python). It has a visual programming front-end for explorative data analysis and visualization, and can also be used as a python library. The program is maintained and developed by the bioinformatics laboratory of the faculty of computer and information science at university of ljubljana [1].



6. Classification techniques

6.1. Naïve Bayes

A naive Bayes can be certainly an undeviating probabilistic model formed on Bayes principle together side a solid uniqueness assumption. This model grips a simplifying restricted individual theory. That is expected a positive class or negative class; the opinions are perhaps free of all others. This concept not modification the accuracy in text classification by sufficient but sort's high-speed classification algorithms used for the problem. Naive bayes is a manageable, yet powerful and generally-used, ml classifier. It is a probabilistic classifier that presents classifications applying the height a posteriori settlement practice in a bayesian. It can likewise be designed utilizing a very easy bayesian. Naive bayes has been particularly successful for text classification, and are a universal resolution for queries such as spam exposure.

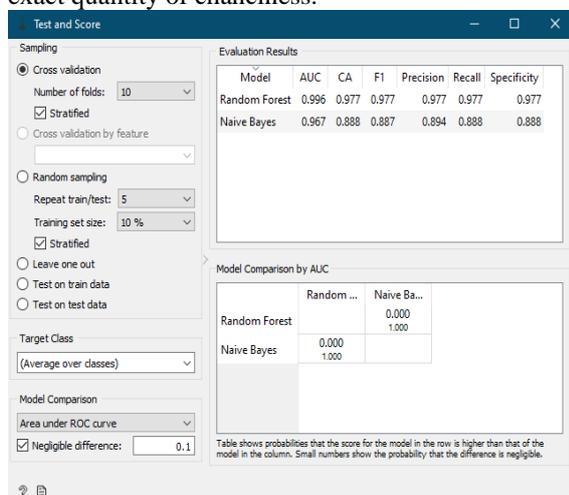


6.2. RandomForest

It is best in accuracy amongst popular algorithms. It works efficiently on a huge dataset. It can manage thousands of data variables externally variable deletion. It provides estimations of variables that are significant for the classification. Collective classification methods are reviewing algorithms that make a set of classifiers reasonably than one

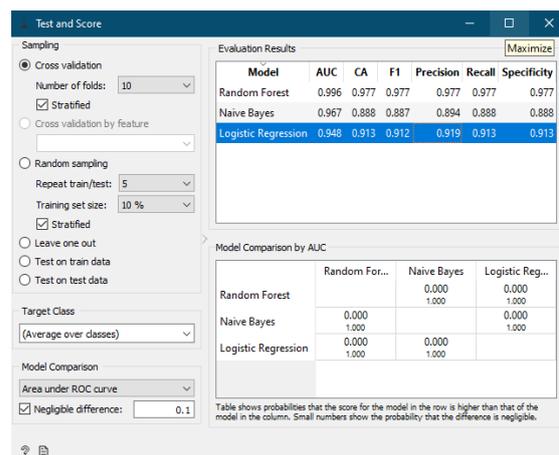
classifier, and then classify dissimilar data purposes by taking a bulk of their predictions. The maximum usually utilized collective classifiers are Bagging, RandomForest and Boosting. Random forest is a resilient, simple to practice ML algorithm that offers, even externally hyper-parameter attuning, a big result most maximum of the time. It is additionally one of the several related algorithms, because of its clearness and variety. In a regular decision tree classifier, a decision at a node split is made based on all the feature attributes. But in Random Forest, the best parameter at each node in a decision tree is made from a randomly selected number of features[5].

The random forest sort a group of classification methods that depend on the order of diverse decision trees. The fussiness of such Groups of Classifiers is that their tree-based sections are higher from an exact quantity of chanciness.



6.3. Logistic regression

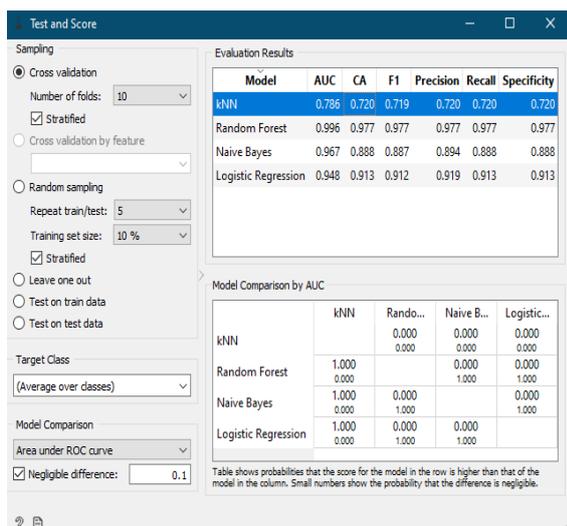
Logistic regression is the proper regression study to handle when the subject variable is binary. Like all regression studies, logistic regression is a guessing analysis. Logistic regression is applied to represent data and to describe the connection among one binary variable and one or more ordinal, nominal, ratio-level or interval free variables. Seldom logistic regressions are hard to read; the intellectus tool simply enables you to manage the analysis, then in common english represents the output. logistic regression is a diverse technique practiced by machine learning from the area of statistics. Logistic regression is a go-to method for binary classification problems. This algorithm usually divides the data set according to a decoration that maximizes the range of the data, rising in a tree-like formation.



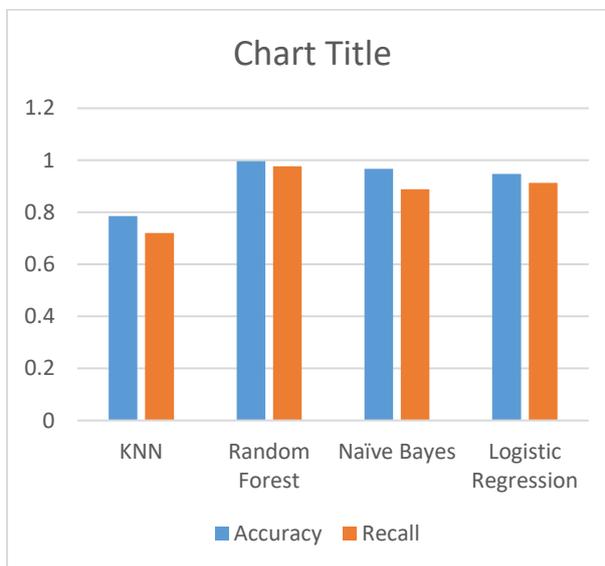
6.4. Knn

K nearest neighbors is a simplistic algorithm that stocks all possible problems and classifies new arguments based on a comparison test. Knn practiced statistical evaluation and pattern identification previously in the start of 1970’s as a non-parametric method. Knn algorithm is a mere, supervised machine learning algorithm that can be applied to solve both regression and classification problems. It’s simple to perform and experience but has an influential drawback of maturing significantly slows as the size of that data is increased. The k nearest neighbor (knn) method has widely been used in the applications of data mining and machine learning due to its simple implementation and distinguished performance[4].

Sr. No	Algorithm	Accuracy	Recall
1	KNN	0.786	0.720
2	Random Forest	0.996	0.977
3	Naive Bayes	0.967	0.888
4	Logistic Regression	0.948	0.913



6.5. Classification algorithm table



7. Conclusion

In this paper we use four classification algorithm to classify the gender on the base of their voice frequencies that are provided in the dataset. Random forest show the highest accuracy rather than the other classification algorithms that are used like naïve Bayes, Knn and logistic regression. Random forest also take the smallest time to make the prediction about the dataset. On the other hand the Knn show the lowest accuracy for the prediction of the gender identification by the classification algorithm through orange tool but the Knn took the smallest recall time to show the result. Random forest show the highest accuracy but the, it's take the long recall time rather than the all other algorithms are used in this study. Naïve Bayes and logistic regression show good accuracy and deal nicely with this data set.

References

1. Amrita Naika *, Lilavati Samantb. Correlation review of classification algorithm using data mining tool: WEKA

2. https://www.mldata.io/dataset-details/gender_voice/
3. JSI Sound – a machine-learning tool in Orange for simple biosound classification. Martin Gjoreski, Borut Budna, Anton Gradišek, Matjaž Gams
4. SHICHAO ZHANG, XUELONG LI, MING ZONG, XIAOFENG ZHU, and DEBO CHENG. Learning k for kNN Classification
5. Santosh Joshi, Himanshu Upadhyay, Leonel Lagos, Naga Suryamitra Akkipeddi, Valerie Guerra. Machine Learning Approach for Malware Detection Using Random Forest Classifier on Process List Data Struct

