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Tract Angle using Machine Learning

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***Abstract:** In this paper, we are going to predict the price and future evaluation of property using various machine learning algorithm. Rate of property are determined by number of factors such as area of property, age of the property, surrounding factor including market, school, hospital and so on. For effectively increasing the accuracy percentage of prediction, we have used some machine learning algorithms. It needs more accurate method based on the location, property type, size, local amenities, and some other factors which could affect property demand. Firstly, we get dataset from Kaggle.com in excel file. When we want to predict the rate of any property we can just give input to the system. Using back propagation on tensor flow algorithm, the system will predict the property rate (Future Evaluation) and display the output according to user requirement. With limited dataset and data features, a practical and composite data pre-processing, creative feature engineering method is examined in this paper.*

***Keywords:** Back Propagation Algorithm, Tensor Flow Algorithm, Machine Learning, Dataset*

I. INTRODUCTION

Property is generally used for investment as well as residential purpose. Many people invest their savings or money in properties because their property value does not decrease rapidly and usually increases day by day. Variation in property rate can affect various household investors, bankers, policy maker and many others. Predicting the property rate is an important economic index. India ranks second in the world in number of households according to 2011 census with number of 24.67 crore. According to 2017 version of emerging trends in real estate asia pacific, mumbai and bangalore are the top-ranked cities for investment and development.

One particular reason is that there are various factors that influence the potential rate of the property, making it more difficult for an individual to decide how much a property is worthy on their own without any external help. This can lead to people making non-profitable or improper decisions about whether to purchase or sell their properties and at which rates which reasonable. As property are long term investments, it is imperative that people make their selections with the most accurate and profitable information possible.

Machine learning develops algorithm and builds models form data, and uses them to predict on new data. The main difference with traditional algorithm is that a model is built from inputs data rather than just execute a series of instructions. Supervised learning uses data with result labeled, while unsupervised learning using unlabeled data. There are a few common machine learning algorithms such as regression, classification, neural network and deep learning.

How to use machine learning algorithms to predict property rate? It is challenging to get as closely as possible result based on the model build. For a specific property rate it is determined by location, size, property type, city, country, tax rules, economic cycle, population movement, interest rate and many other factors which could affect the demand and supply.

Generally property values raise with respect to time and its appraised value need to be calculated. This appraised value is required during the sale of property or while applying for the marketability of the property. Here, we required an automated prediction model that can help to predict the property value without any bias. This automated model will the new buyers and less experienced customers to understand whether the property rates are overrated or underrated.

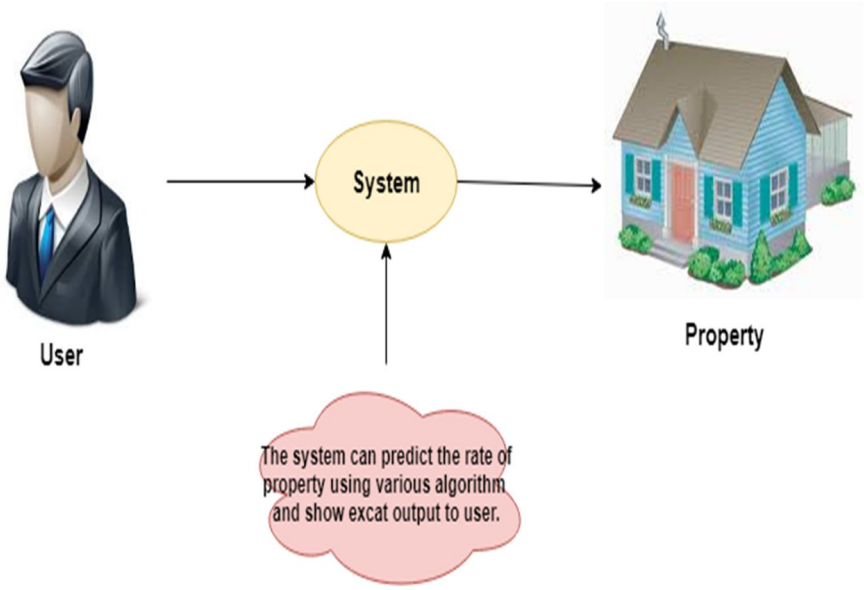
II. METHODOLOGY

A. Machine Learning Algorithms

1) Random Forest: Random forest algorithm can be helpful to predict both the classification and the regression it is also called as the regression forests. The main process is it evolved many decision tree based on the random selection of data and the random selection of variables and it provides the class of dependent variable based on many trees. The main advantage of using this algorithm for our dataset as it handle the missing values and it can maintain the correctness of the missing data and the chance of over fitting the model is low and we can except high spatial property when we apply to the large level dataset. In regression trees, the outcome will be continuous.

2) *Multiple Regression:* It's a latest version of the linear regression which is considered to be more powerful which works with the many variables or the many features it helps to predict the unknown value of the attribute from the known value of the two or more attributes which will be also known as the predictors.
3) *Support Vector Machine:* Support vector machine regression is abstracted from the classification algorithm known as the support vector machine SVM gives a hyper plane that splits the points with the various labels here we are using the similar method rather than dividing the data it produces a hyper plane that is close to the most of the points.
4) *Gradient Boosting:* Gradient boosting can be used for both the regression and classification gradient boosting is a method for producing regression models consisting of group of regresses it is an creation of this idea for regression the main business is to frequently follow the procedure here we are learning the simple regression predictor of the data then we are enumerating the error residual. The amount of the error per data point and we have learn a new model to predict the error residual. The main approach is we are making a set of predictions then finding the errors and we are reducing it.
5) *Ensemble Learning Bagging:* It is concept of machine learning known as the ensemble learning mete algorithm which is designed to enhance the stability and to reduce the variance and accuracy. It's nothing but the application of group learning so essentially here many models are built they come together and bring a forth model that is more detailed. In bagging various models are assembled in parallel on different samples and then the various models vote to give the final model and hence do prediction.
6) *Neural Networks:* MLP is the multilayer perceptron it is a part of artificial neural networks it has the same architecture of a single layer perceptron with one or more hidden layers, in this the hidden layer will be directly connected to the input layer here the input values are presented in the perceptrons, the perceptrons will organize any linear separable set of inputs if the input values presented to the perceptron, and if the predicted output is as same as the desired output, then the performance is considered adequate and we know that no changes to the weights are done, if it does not match then the weights need to be changed to overcome the error.

B. Figures and Tables



III. CONCLUSION

In this research paper, we have used machine learning algorithms to predict the property rate. We have specified the step by step procedure to analyze the dataset and finding the relation among the parameters. Thus we can select the parameters which are not correlated to each other and are self-sufficient in nature. Hence we evaluated the performance of each model using different performance metrics and compared them based on these metrics. For future work, we recommend that working on large dataset would yield a better and real picture about the model. We have attempted only some Machine Learning algorithms that are actually classifiers but we need to chain many other classifiers and understand their predicting behavior for consecutive values too. By enhancing the error values this research work can be useful for development of applications for various localities.

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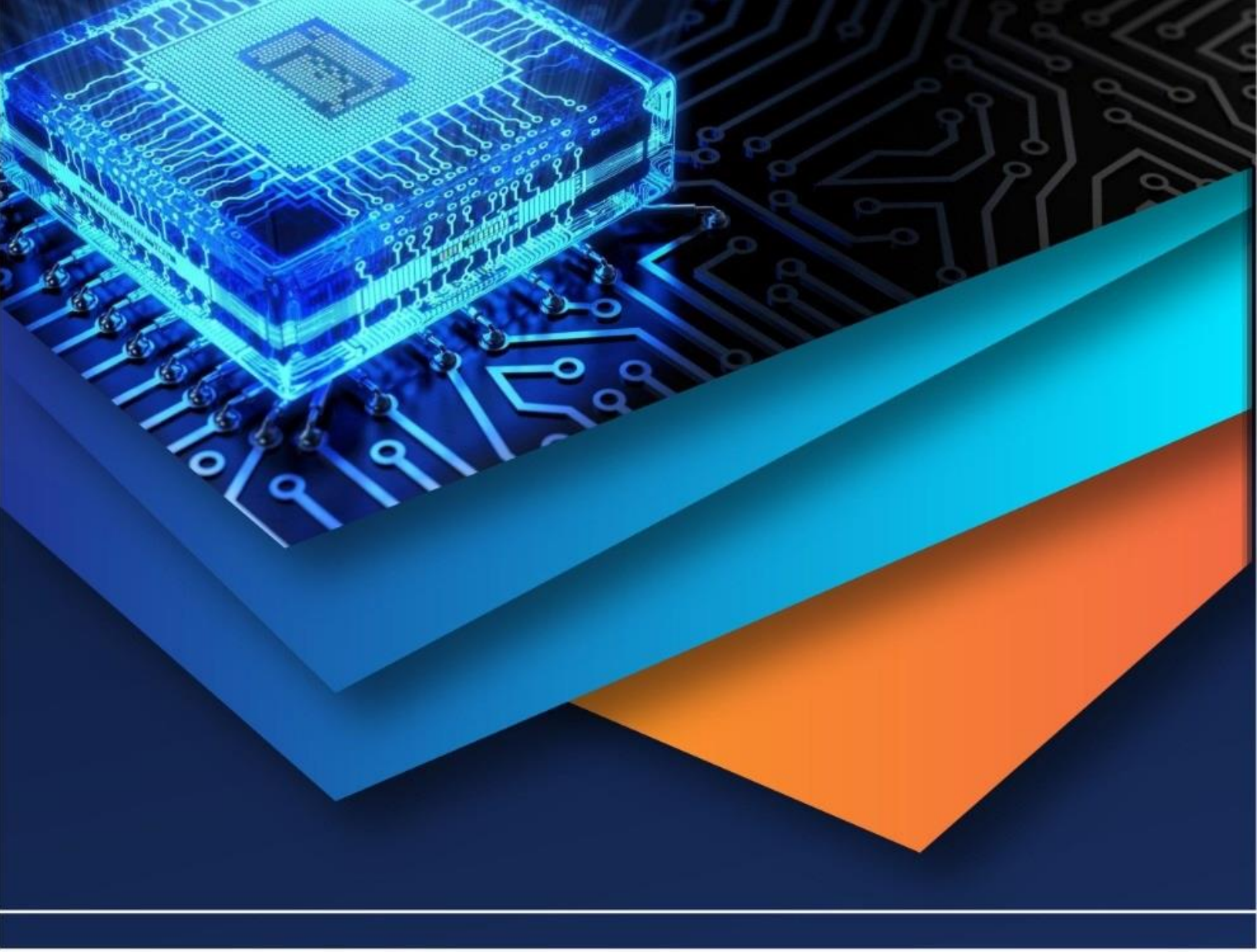

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