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USE OF ARTIFICIAL NEURAL NETWORK IN VALUATION OF LAND AND BUILDING PROPERTIES

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ABSTRACT

Deep Learning and Artificial Intelligence is essential now a days. Property value is one important element to be kept in consideration. The real estate is developing quickly now a days. As High level of capital is consumed for the real estate, it is of prime need to have an idea of the worth of property. This study gives a solution for finding worth scientifically using artificial Neural Networks. The present worth of the subject property can be found using, sales data of the data properties in the vicinity. Collected data is applied to Neurons of input layer and connected using weights. Ramp type activation function is used to process the data .After processing the data in several hidden layers we can get results in output layer. And from results in output layer, present worth of the subject property can be found.

KEYWORDS: Neuron, Weight, Data Properties, Subject Property, Market Value

INTRODUCTION

ANN is the word heard and read now a days. Here study shows why it is often used now a days. This study shows how ANN can be used for valuation of property. It also shows multiple perceptron works.

In ANN work is processed in Layers viz. Input layer, hidden Layers and output layers. Inter layer connections are done with property weights.

After inputting data and applied weights, activation function is used to process the data in hidden layers. Then after results are sent to output layer.

From output layer, we can get the result i.e. Market value of the subject property.

LITERATURE REVIEW

As per Erkam Guresen Gulgun Kayakutlu, Turkey [1]. Haykin defines ANN as massive parallel combination of simple processing acquiring knowledge from environment with learning. Common character of existing defination of ANN was comparison with biological neurons.

He proposed ANN defination with study about conflict of mathematical models. In his research various features of ANN is demonstrated for graph theory and mathematics.

Yanbo Huang, in Advances in Artificial Neural Networks – Methodological Development and Application [2], explains methodology for ANN. The study explains various advanced concept of ANN. A graph of Numbers of Hidden Layers versus Error is also explained. As per study if number of hidden layers is more, the error will be less resulting more accurate model.

Maad M. Mijwel , in "Artificial Neural Networks Advantages and Disadvantages "[3], explains various advantages and disadvantages of ANN. He explains advantages like information is stored on entire network, can work with incomplete knowledge also, distributed memory, parallel working capacity e.t.c.

The study explains disadvantages of ANN like hardware dependency, no specific rule for selection of structure of ANN, network solving difficulty e.t.c.

Magdi Zakaria, Mabrouka AL-Shebany, Shahenda Sarhan Sirte University SIRTE, LIBYA in "Artificial Neural Network : A Brief Overview "[4], says that there are three characteristics for definition of ANN viz. numbers of layers and nodes, learning mechanism for updating weights/ connections and activation function. He also explains multi-layered perceptron i.e. input layer, hidden layer and output layer.

PURPOSE

Study of Artificial Neural Networks and to find Market Value of the property using Artificial Neural Network.

METHODOLOGY

Basically there are thee approaches for valuation of the property

1. Market Approach
   It uses sales data from market .
2. Income approach
   It uses net income generated from the property.
3. Cost approach
   It uses actual cost incurred in construction.

All the three approaches have limitations as mentioned above. So in this research we have tried to develop scientific method

for overcoming above stated limitations.

Artificial Neural Network (ANN) works in Various Layers. i.e. Input Layer, Internal hidden layer or layers, Output Layer. This study uses Market Approach.
Various steps or stages in this research are mentioned below,

1. Qualitative data from field just nearby to subject property, for each and every variables are collected for two types of properties namely,
   1) Subject property (valuation of the property required)
   2) Data properties (known value properties in the vicinity of the subject property)
   As far as possible fresh data shall be collected.
2. Here, variables are Neurons or Nodes and connected to each other by respective weights.
3. Each Node performs calculations. It uses ramp function as activation function.
4. Each connection conveys a signal from one node to another depending on connection strength. Such a Network is called Artificial Neural Network.
5. Another constants for each and every variables shall be introduced. Bias is also introduced.
6. Collected data is arranged in tabulated form.
7. Collected data are applied to input layer.
8. After processing data from input layer, it conveys signals to another layer.
9. Similarly after processing all the hidden internal layers results are conveyed to output layer.

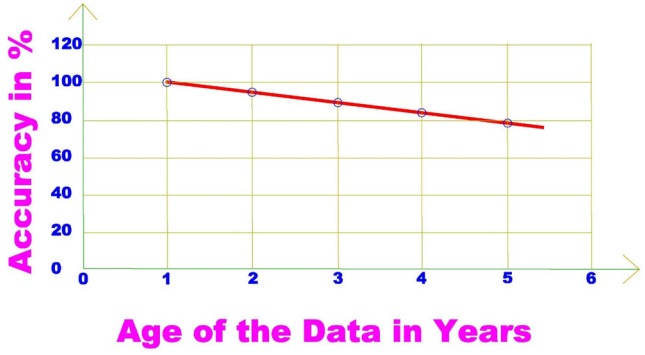
RESULTS

For a Property near Vaishnodevi Circle, Khoraj, Ahmedabad, Data values of data properties are collected and analyzed by ANN. And Land rate is found as 97000.00 Rs/Sq. Mts. And it is matching with actual rate at site.

CONCLUSION

For checking accuracy of the research, fresh data as well as 1 to 5 year old data of data properties are used.

From this research, it is concluded that if data is fresh than it will results in 98 to 100 % accuracy. And for older data accuracy reduces to about 5 % for each one year oldness.



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