1. Modeling Property Prices Using Neural Network Model for Hong Kong

This paper develops a forecasting model of residential property prices for Hong Kong using an **artificial neural network approach.** Quarterly time-series data are applied for testing and the empirical results suggest that property price index, lagged one period, rental index, and the number of agreements for sales and purchases of units are the major determinants of the residential property price performance in Hong Kong. The results also suggest that the neural network methodology can learn, generalize, and converge time series.

Faster computers with greater data handling capabilities, in conjunction with multivariate analysis, have provided the ability to study complex non-linear relationship between property price and the supply and demand for houses. Neural networks are suited to handle non-linear problems because of their adaptability due to their structure; i.e., non-linear activation functions. It has been demonstrated that any arbitrarily irregular patterns can be mapped by artificial networks (Widrow et al., 1994).

1. THE ANALYSIS OF THE DETERMINANTS OF HOUSING PRICES

housing price analysis in less developed countries submit controversial and not sufficient results about the impact of interest rate, inflation and unemployment. Moreover, it does not investigate the influence of demographic variables and the means of economic policy. In this article the effect of GDP, unemployment, inflation, interest rate, emigration and the means of macroprudential policy on housing prices in Lithuania was evaluated. The results showed that inflation, interest rate and emigration are not causal determinants of housing prices, which mostly depend on GDP, unemployment, the means of macroprudential policy and the average housing prices in the previous period.

**Granger causality test and multiple regression was used here**.

1. Fusing Neural Networks, Genetic Algorithms and Fuzzy Logic for Analysis of Real Estate Price

It is generally acknowledged that the price of real estate are highly complicated and are interrelated with a multitude of factors. It will be advantageous if the parties to a dispute have some insights to some degree. **This paper introduces a hybrid genetic algorithm (HGA) approach to instance selection in artificial neural networks (ANNs) for housing price determinants**. ANN has preeminent learning ability, but BP training algorithm is based on the error gradient descent mechanism that the weight inevitably fall into the local minimum points. In this paper, an improved genetic algorithm was used to optimize the weights of neural network A case study was carried out on housing price determinants of a sample project using this model. The results concerning the efficiency of the proposed framework in terms of accuracy and computational time are also presented. It shows that more accurate price prediction of real estate can be acquired with the GA-ANN model.

1. Geographically Weighted Regression Model (GWR) Based Spatial Analysis of House Price in Shenzhen.

Through applying spatial statistical analysis, **Geographical Weighted Regression (GWR)** model and GIS technology, this study aims at finding the relationship between the effects of various factors and spatial distribution of residential house price. The traditional regression models are reviewed firstly, the model without the consideration of spatial characteristics cannot reach very nice precision to simulate the spatial distribution of the house price. In this study, the spatial statistical model, coupled with GIS as well as GWR model, is developed. The proposed model is validated using the house price data in Shenzhen, China, when considering these factors such as the land price, transportation, the distance to the commercial center, the distance to hospital, school, the house type, the brand of the house etc. It is demonstrated that our approach provides an effective model to present the distribution of the residential house price and serve as a tool for house price appraisal during the property tax levy process.

1. Predicting property prices with machine learning algorithms.

This study uses three machine learning algorithms including, **support vector machine (SVM), random forest (RF) and gradient boosting machine (GBM)** in the appraisal of property prices. It applies these methods to examine a data sample of about 40,000 housing transactions in a period of over 18 years in Hong Kong, and then compares the results of these algorithms. In terms of predictive power, RF and GBM have achieved better performance when compared to SVM. The three-performance metrics including mean squared error (MSE), root mean squared error (RMSE) and mean absolute percentage error (MAPE) associated with these two algorithms also unambiguously outperform those of SVM. However, our study has found that SVM is still a useful algorithm in data fitting because it can produce reasonably accurate predictions within a tight time constraint. Our conclusion is that machine learning offers a promising, alternative technique in property valuation and appraisal research especially in relation to property price prediction.

1. Residential Property Prices in Croatia

Hedonic regression

1. The impact of COVID-19 on house prices in Northern Ireland: price persistence, yet divergent

Hedonic regression

1. The impact of employment on housing prices: Detailed evidence from FDI in Ireland

Hedonic regression

1. Using Machine Learning to Forecast Residential Property Prices in Overcoming the Property Overhang Issue.

Overhang property issue has sustained over the past ten years in Malaysia. Major overhang property issue was contributed from the unsold residential property. Though the government announced to build a data system and provide the housing data to prevent a mismatch of supply-demand in the property market, there are still not many relevant studies or research on predicting residential property prices. Hence, it is essential to understand the factors that influence the price of residential properties. **The study aims to predict the price of a residential property by using a machine learning algorithm. Three algorithms were selected, namely Decision Tree, Linear Regression, and Random Forest, tested against the training and testing datasets obtained from the Malaysian Valuation and Property Services Department.** Results show that the Random Forest model produced high accuracy with lower r\_squared (R2 ), RMSE, and MAE values. Significantly, the study has contributed a new insight into essential property features that primarily influence the property price, which will be useful for property developers and buyers who wish to invest in the property market.

Data : <https://www.irelandtownslist.com/>