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Introduction

Predicting housing resale prices is a critical task for individual investors, real estate agents, and policymakers. Accurate predictions can help in making informed decisions regarding buying, selling, and investing in properties. Various methodologies, including machine learning algorithms, statistical models, and big data analytics, have been employed to enhance the accuracy and reliability of these predictions.

Key Insights

- **Machine Learning Algorithms for Prediction**:
  - Various machine learning algorithms such as Random Forest, Gradient Boosting, and AdaBoost have been effectively used to predict housing resale prices. These models consider multiple factors including physical attributes, location, and economic variables to enhance prediction accuracy 2 4 8 9 .
  - Ensemble learning methods, which combine multiple models, have shown high accuracy in predicting resale prices. Techniques like XGBoost, LightGBM, and deep-Random Forest have been particularly effective, achieving low mean absolute percentage errors 3 .

- **Neural Networks**:
  - Delayed neural network models have been used to predict public housing prices by estimating trends in resale price indices. These models incorporate various economic and demographic variables to produce accurate predictions [1].
- **Big Data Analytics**:
  - Big data technologies have been leveraged to analyze large datasets and uncover hidden patterns that influence housing prices. Models such as linear regression, Random Forest, and Gradient Boosting have been used for feature selection and prediction, with Gradient Boosting showing efficient results [4].
- **Empirical and Statistical Models**:
  - Empirical models that adaptively alter reservation prices for buyers and sellers have been formulated to predict market behavior for resale homes. These models consider the dynamic nature of the housing market [5].
  - Vector autoregressive (VAR) models with error correction have been used to forecast sales and prices, revealing a bidirectional causality between sales volume and median sales price [7].
- **Index-Based Prediction**:
  - Inflating previous selling prices using published house price indices, and modifying these indices with observed repeat sales, has been shown to improve prediction accuracy. This method achieved lower predictive errors compared to using unmodified indices [6].

Conclusion

Predicting housing resale prices involves a variety of methodologies, each with its strengths. Machine learning algorithms, particularly ensemble methods, have demonstrated high accuracy. Neural networks and big data analytics also provide robust frameworks for prediction. Empirical models and statistical approaches like VAR models offer insights into market dynamics, while index-based methods enhance prediction accuracy by incorporating historical sales data. Combining these approaches can lead to more reliable and comprehensive predictions in the housing market.

Export

Predicting public housing prices using delayed neural networks 1

The delayed neural network model effectively predicts public housing prices in Singapore, with good fit and predictions based on nine independent economic and demographic variables.

2016 IEEE Region 10 Conference (TENCON) Lipo Wang et al.
22 citations 2016

Study snapshot

House Resale Price Prediction Using Classification Algorithms 2

This paper compares various classification algorithms to predict house resale prices, focusing on accuracy and considering factors like physical attributes, location, and economic factors.

2019 International Conference on Smart Structures and...
P. Durganjali et al. **15** citations 2019

Study snapshot

Forecasting House Resale Prices using Ensemble learning 3

A blending model using Python and xgboost, DF21, and Geatpy packages can accurately predict house resale prices in Singapore with a mean absolute percentage error of 7.36% in a stationary overall trend.

2023 2nd International Conference on Big Data, Information...
Zhenyu Li et al. **0** citations 2023

Study snapshot

Big data analytics predicting real estate prices 4

The gradient boosting model effectively predicts real estate prices using large amounts of data, outperforming other models like linear regression and random forest.

International Journal of System Assurance Engineering and...
Archana Singh et al. **15** citations 2020

Study snapshot

An empirical model of the market for resale homes 5

This model accurately predicts the market for resale homes, with both buyers and sellers adaptively altering reservation prices, and shows that the search process

for a house can be modeled using single-family residential homes.

Journal of Urban Economics Peter T. Chinloy et al.
36 citations 1980

Study snapshot

Predicting a house's selling price through inflating its previous selling price 6

Inflating a house's previous selling price using repeat-sales information can accurately predict its selling price, with an average predictive error of 8.4% compared to 10.9% using the best published index.

Journal of the Operational Research Society A. Brint et al.
6 citations 2009

Study snapshot

Forecasting Sales and Price for Existing Single-Family Homes: A VAR Model with Error Correction 7

The VAR model with error correction effectively forecasts sales and prices for existing single-family homes, with price significantly affecting sales and sales weakly affecting price.

Journal of Real Estate Research Zhonglin Zhou et al.
44 citations 1997

Study snapshot

Real Estate Price Prediction Using Artificial Intelligence 8

The Random Forest algorithm effectively predicts housing prices, promoting transparency and discouraging fraudulent activities.

International Research Journal of Computer Science
N. Kalyani et al. **0** citations 2023

Study snapshot

Using machine learning algorithms for housing price prediction: The case of Fairfax County, Virginia housin... 9

The RIPPER algorithm consistently outperforms other machine learning algorithms in accurately predicting housing prices in Fairfax County, Virginia, aiding house sellers and real estate agents in informed decisions.

Expert Syst. Appl. Byeonghwa Park et al. **262** citations 2015

Highly Cited

Study snapshot

Evaluating House Price Forecasts 10

The hedonic method is more efficient and accurate in forecasting house prices than the repeat sales method, making it a preferred choice for risk-averse managers.

Journal of Real Estate Research J. Clapp et al.
60 citations 2002

Study snapshot

Suggested searches

- Machine learning algorithms for housing price prediction
- Influence of previous selling price on house resale value
- Forecasting real estate prices with big data analytics

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