

Predicting Home Sale Prices for Austin TX

Objective

To build on our existing model to forecast home sales in the Austin, TX by using multiple features instead of just past home sale prices.

The Dataset

Home sales from 2/1998-4/2021 in the Austin, TX.

Population of the Austin area from 1998-2019.

Median household income in the Austin area from 1998-2019.

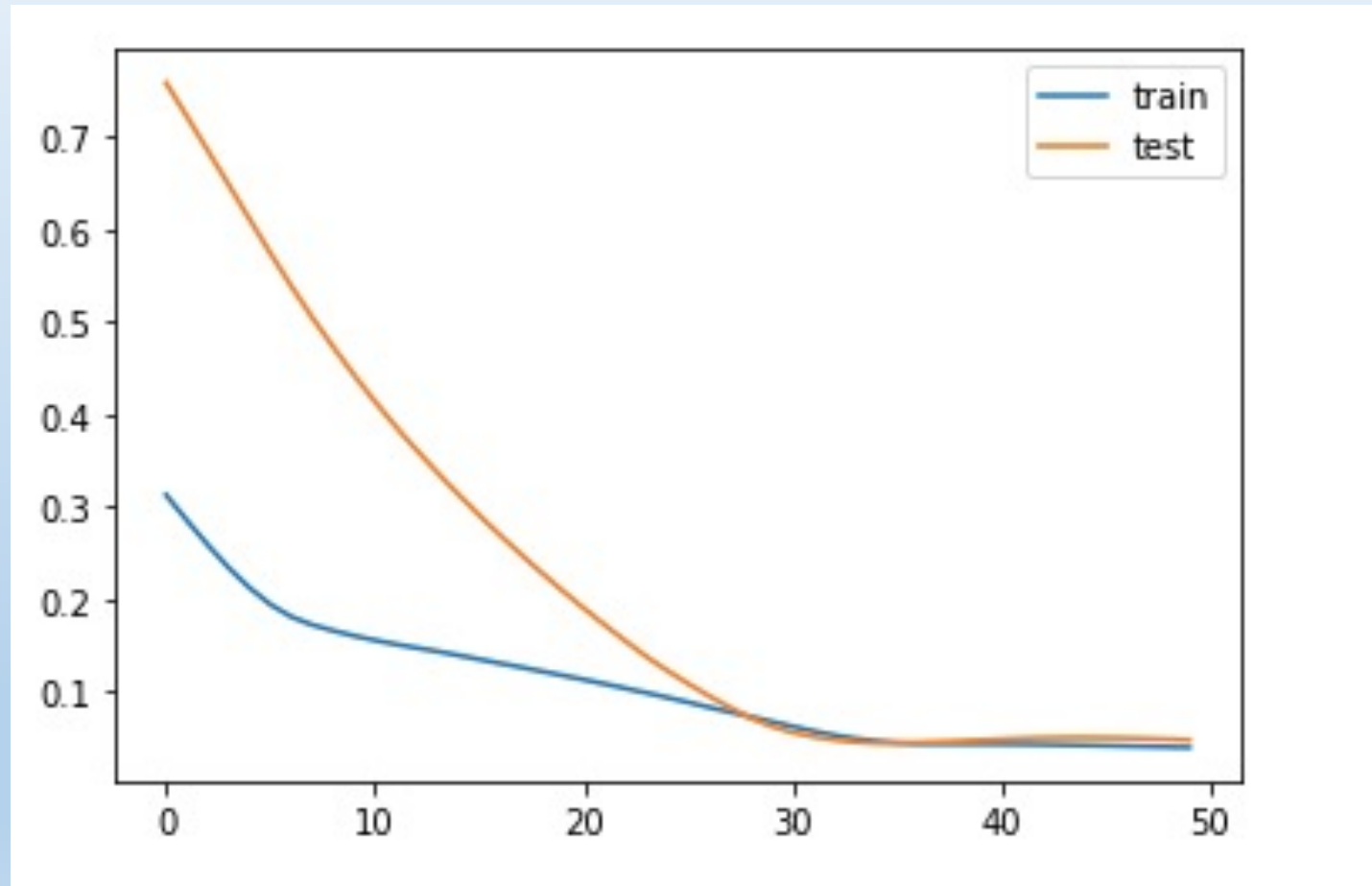
Unemployment in the Austin area 2/1998-4/2021.

Freddie Mac interest rates from 2/1998-5/2021.

Time Series Model

We used a Long Short-Term Model (LSTM). This is a deep learning neural network model that uses past time periods to predict future ones.

Model Validation



The Projection Dataset – 1/2020-12/2022

Home sales from 1/2020-4/2021. From 5/2021-12/2022 projected a monthly increase of 2%.

Unemployment in the Austin area 1/2020-4/2021. From 5/2021-12/2022 projected a stable rate of 4.5 (the rate of 4/2021).

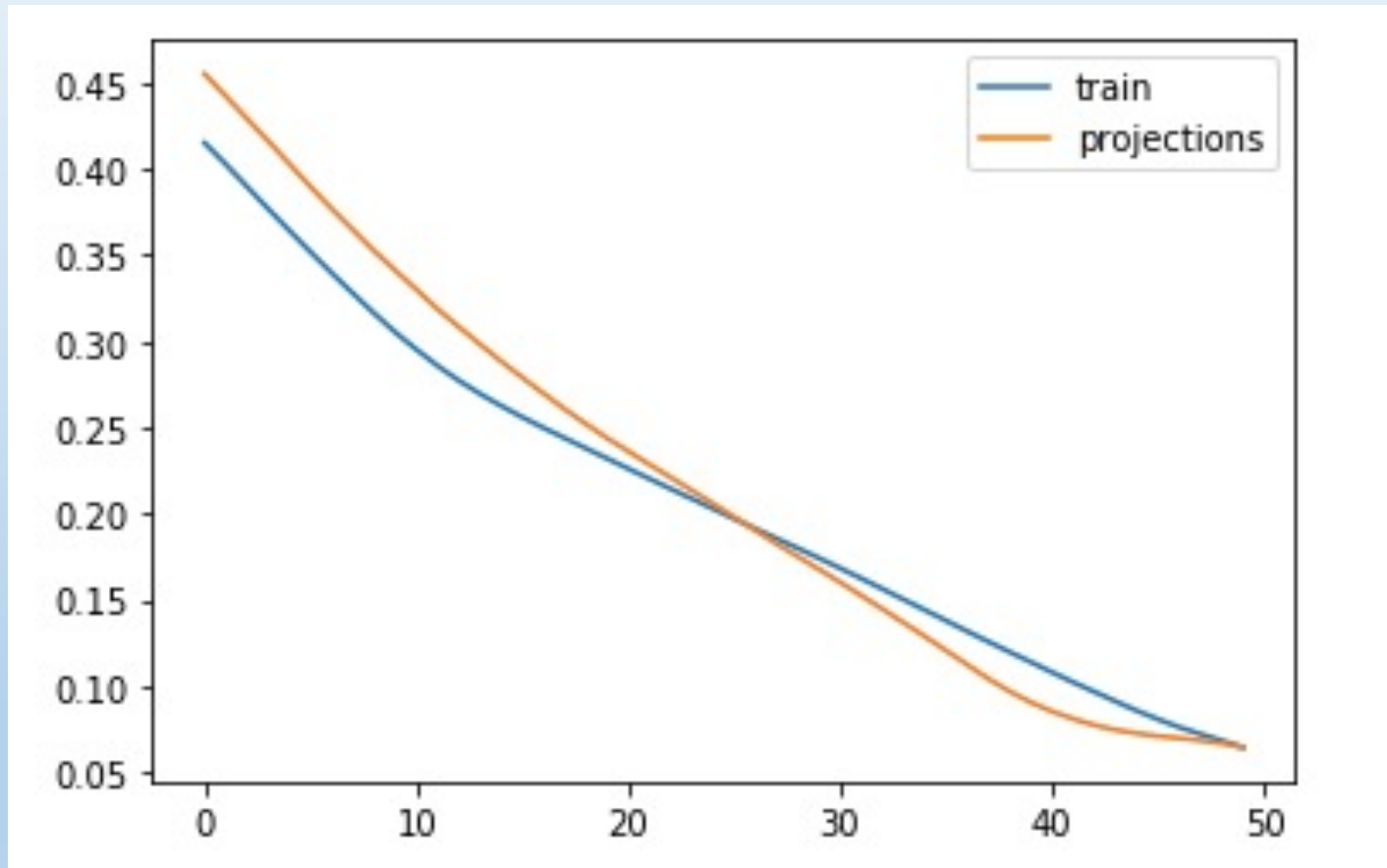
Freddie Mac interest rates from 1/2020-5/2021. From 5/2021-12/2022 projected a stable rate of 2.96 (the rate of 5/2021).

The Projection Dataset

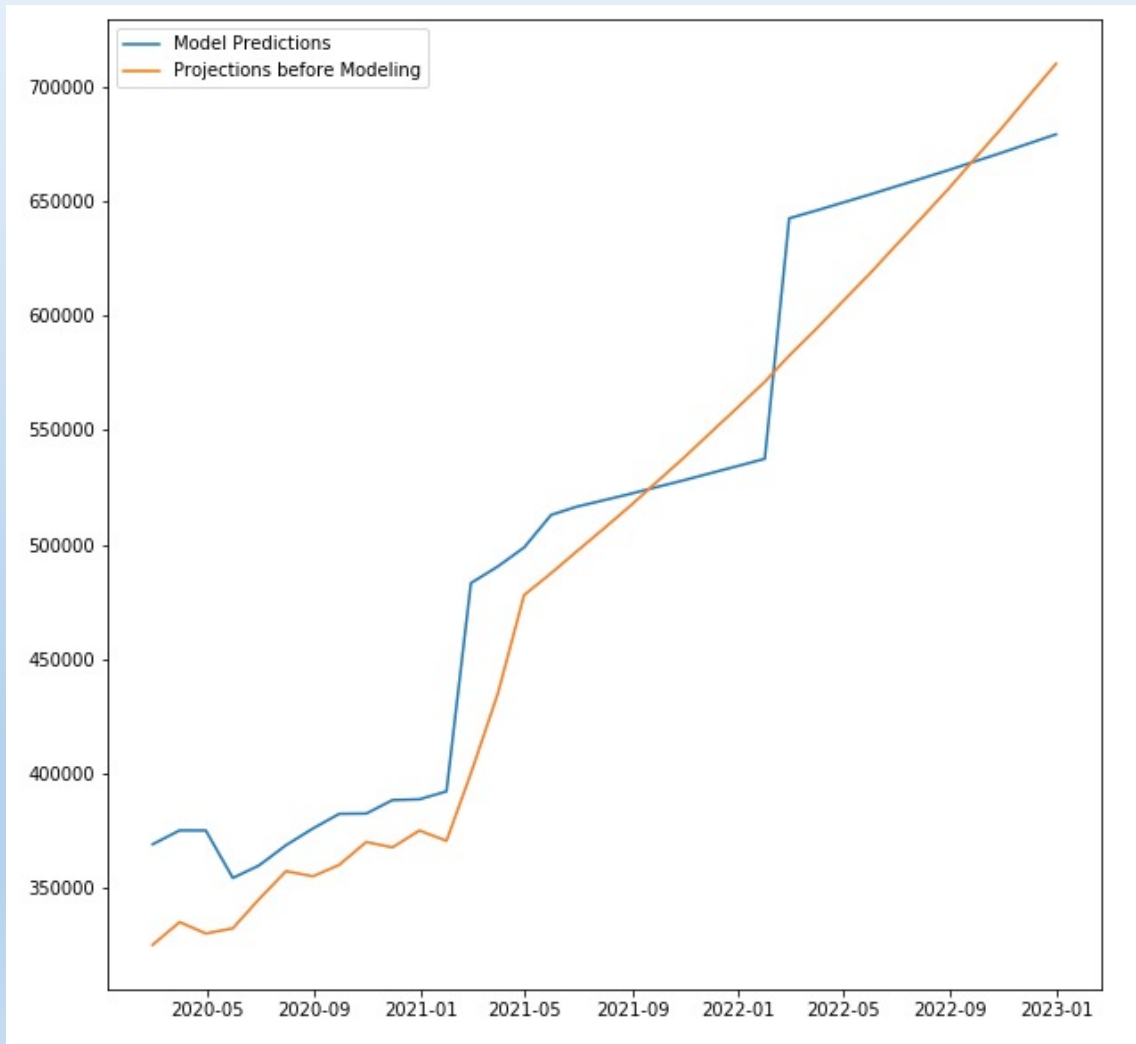
The rate of population growth for the Austin area from 2016-2019 slowed by an average of 0.28% a year. Projections continued this trend.

Median household income in the Austin area from 2016-2019 increased an average of 0.035% a year. Projections continued this trend.

Model Validation for Projections



Model Predictions



Conclusion

This model does well when it has accurate trends for each of the features.

At this point in time, trends in unemployment and interest rates are particularly difficult to predict due to the pandemic. However, as the country opens up and the economy stabilizes, it is likely those future trends will be more clear and the model will have more accurate predictions.