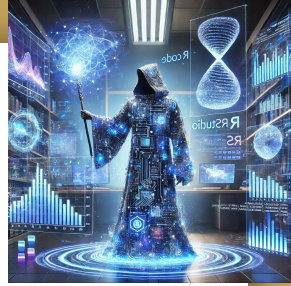


Nathan



Jossua

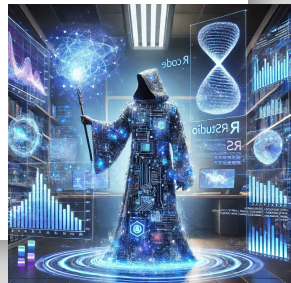
# Classification of the United States Market: Overpriced vs. Underpriced

RStudio Wizards

Bek



Matthew



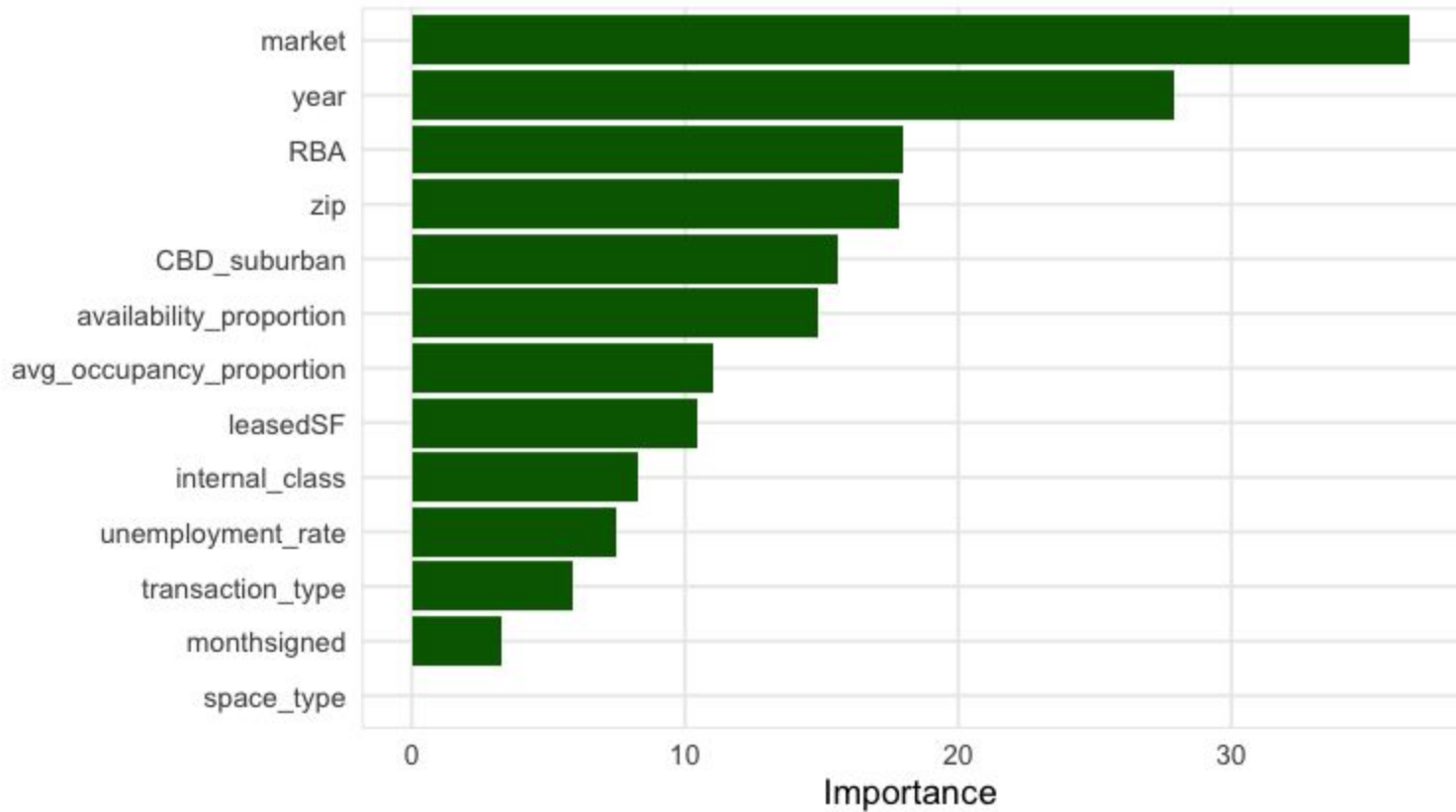
## Research Question:

Can we accurately classify overall rent as underpriced or overpriced to support Savills and renters, and what are the most influential variables contributing to this classification?

## Feature Engineered `Price Category`: Overpriced or Underpriced

- Created a Random Forest, XGBoost, and SVM to predict `Overall Rent`
  - Selected RF as the best model ( $R^2 = .9897$ )
- Created new variable `Price Category`
- Classified `Price Category` as:
  - Overpriced if `Overall Rent` > `Predicted Rent`
  - Underpriced otherwise

## Variable Importance for Predicting Overall Rent



Market Pricing Movement: 2018

Underpriced

Year: 2018

Overpriced



## Market Pricing Movement: 2018

Underpriced

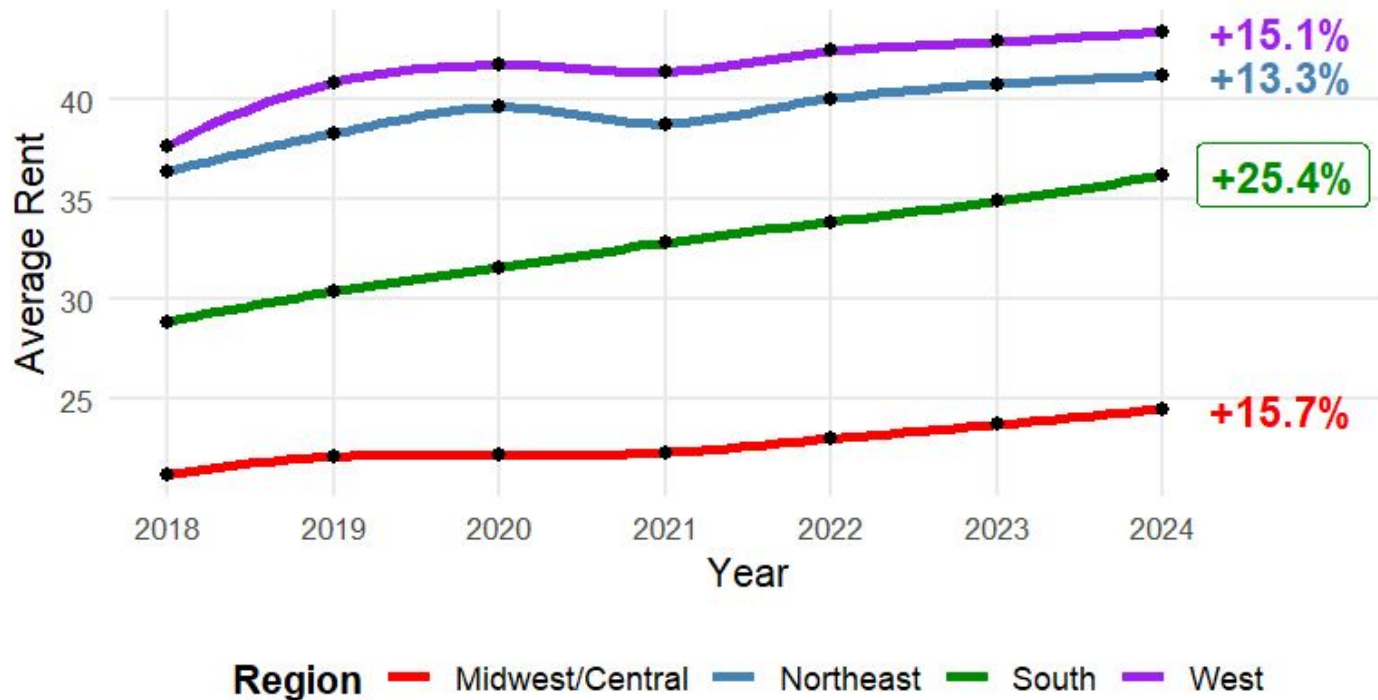
Year: 2018

Overpriced



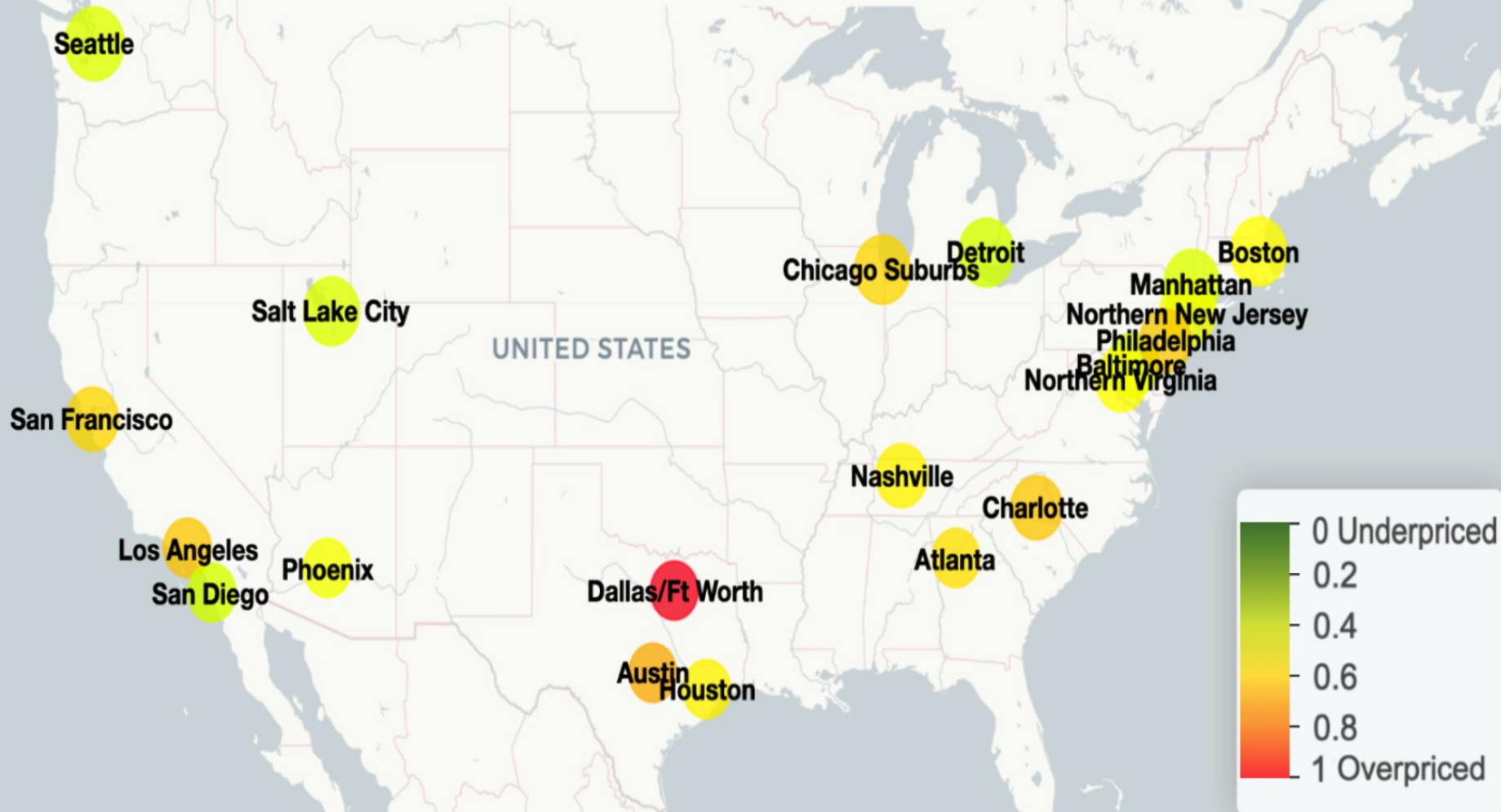
# Regional Rent Trends with Percent Change

2018–2024 cumulative growth by region - Southern rent is on the rise



DataFest 2025 Analysis

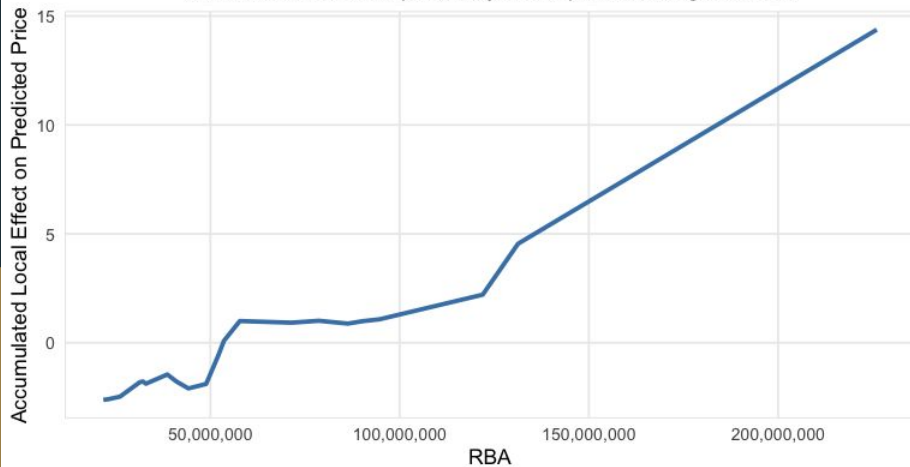
# Proportion of Underpriced to Overpriced: A Map of the USA





### ALE Plot for Rentable Building Area (RBA)

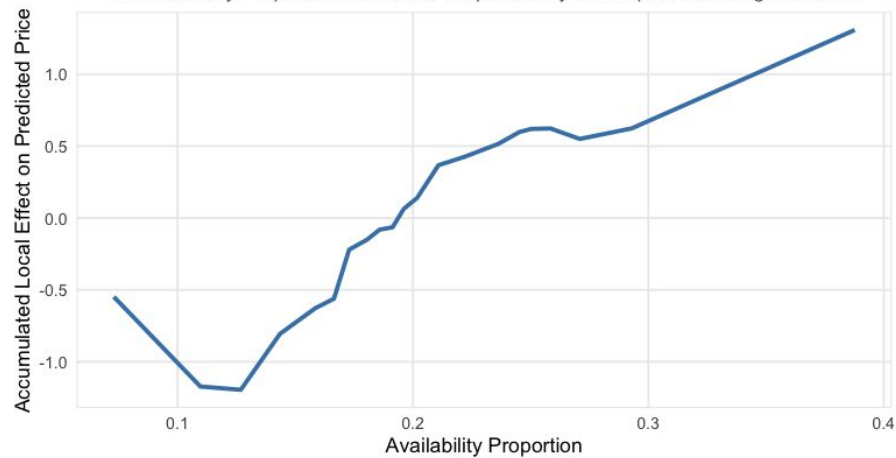
As RBA increases, the probability of overprice occurring increases



DataFest 2025 Analysis








### ALE Plot for Availability Proportion

As Availability Proportion increases, the probability of overprice occurring increases



DataFest 2025 Analysis

Market	RBA	Year	Overall Rent	Predicted Rent	Price Category
Atlanta	94670159.53	2024	32.87	32.53	Overpriced
Austin	37811331.42	2024	46.38	44.27	Overpriced
Baltimore	38603688.98	2024	23.93	24.06	Underpriced
Boston	129644616.28	2024	45.99	45.98	Overpriced
Charlotte	31816266.52	2024	33.24	32.99	Overpriced
Chicago Suburbs	47562918.29	2024	27.71	27.19	Overpriced
Detroit	43913768.82	2024	21.88	21.78	Overpriced
Houston	90513436.23	2024	31.77	31.46	Overpriced
Los Angeles	117404695.65	2024	46.85	46.88	Underpriced
Manhattan	221699219.65	2024	76.28	76.16	Overpriced

8 Buildings in Different Markets with Predicted Pricing						
Market 	RBA 	Year 	Availability Proportion 	Overall Rent 	Predicted Rent 	Price Category 
Atlanta	94670159.53	2024	0.29	32.87	32.6	Overpriced
Austin	37811331.42	2024	0.27	46.38	44.77	Overpriced
Baltimore	38704876.19	2024	0.18	24.14	24.71	Underpriced
Boston	128108299.89	2024	0.19	49.07	46.74	Overpriced
Charlotte	32672385.13	2024	0.24	32.71	32.69	Overpriced
Chicago Suburbs	47608031.26	2024	0.31	27.36	27.05	Overpriced
Detroit	43913768.82	2024	0.25	21.88	21.67	Overpriced
Houston	94243366.81	2024	0.28	31.46	31.19	Overpriced