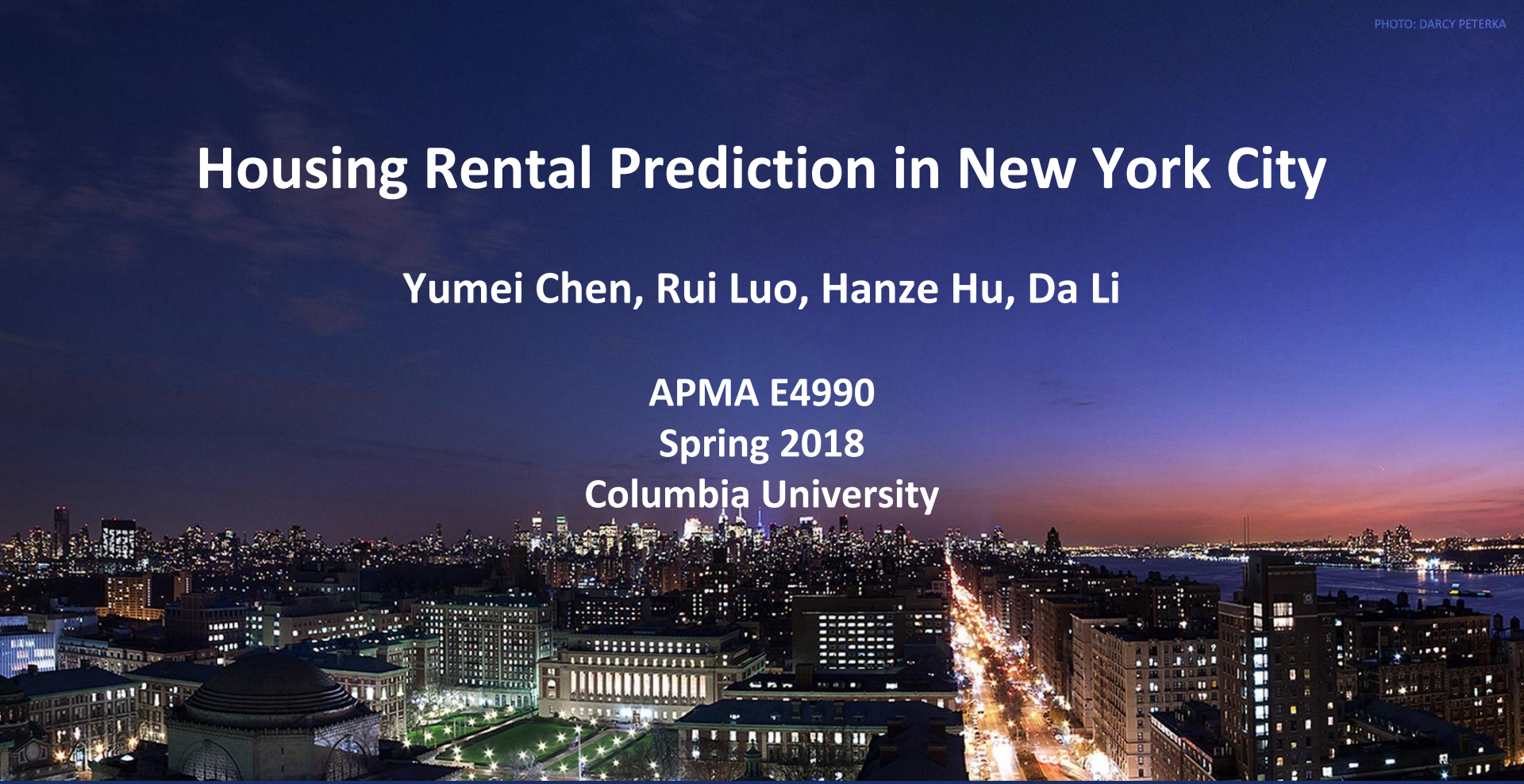

Housing Rental Prediction in New York City

Yumei Chen, Rui Luo, Hanze Hu, Da Li

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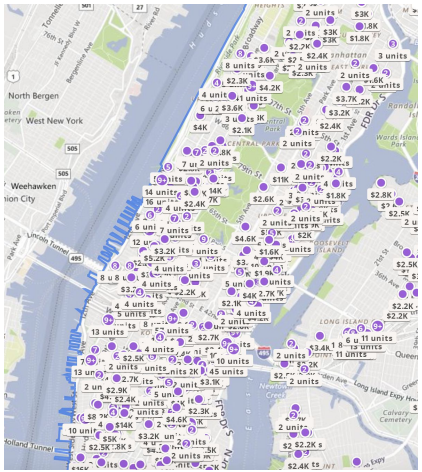
Columbia University

Background & Motivation



- Housing Demand > Housing Supply
- High Rental Price Fluctuation
- Location & Time
- New Residents (Students, workers & Travelers)
- Cost vs Energy vs Time
- Zillows, Trulia, Redfin
- Current rate
- Historical data
- Organization & Agency = Extra Cost
- Capricious nature of NY estate

Objective

To improve the moving and relocating experience of incoming NY residents, a facile and accurate way to predict housing rent in forthcoming months is desired.

Data

Zillow Rental Data History

Single Family House:

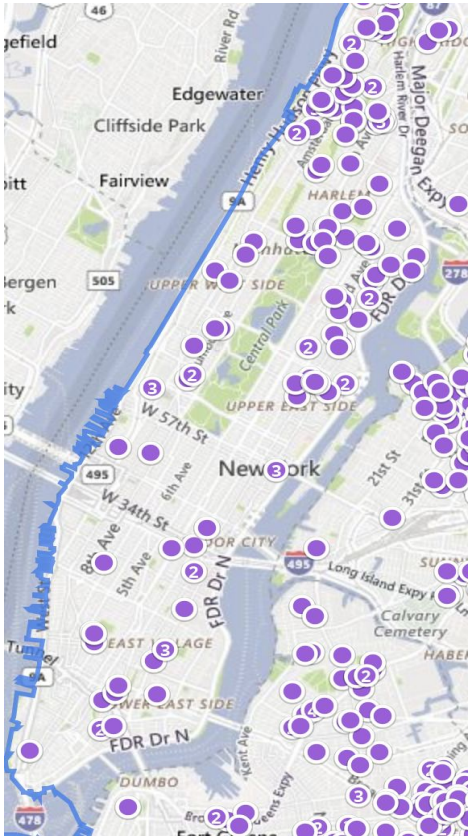
A	B	C	D	E	F
RegionName	City	CountyName	2011-12	2012-01	2012-02
10025	New York	New York	3100	3087	3112
10023	New York	New York	3377	3359	3391
10002	New York	New York	3443	3431	3430
10467	New York	Bronx	1508	1500	1502
11226	New York	Kings	1674	1669	1674

MultiFamily House:

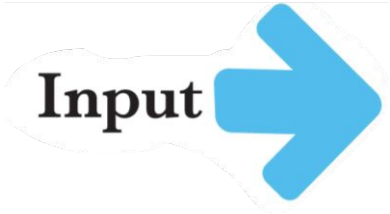
A	B	C	D	E	F
RegionName	City	CountyName	2011-12	2012-01	2012-02
10025	New York	New York	2957	2964	2988
10023	New York	New York	3201	3170	3192
10002	New York	New York	3080	3077	3100
10467	New York	Bronx	1471	1461	1471
11226	New York	Kings	1566	1575	1590

Condo/Co-op

A	B	C	D	E	F
RegionName	City	CountyName	2011-12	2012-01	2012-02
10025	New York	New York	2995	2997	3026
10023	New York	New York	3230	3206	3221
10002	New York	New York	3028	3032	3051
10467	New York	Bronx	1502	1494	1497
11226	New York	Kings	1638	1635	1648



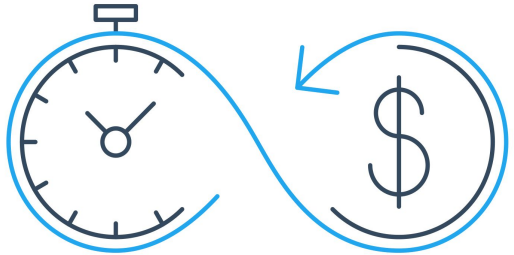
Data



Location

Time

House Type



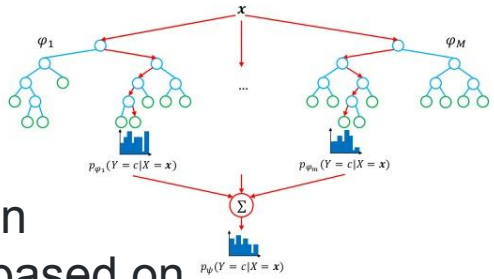
Save time, money and energy based on accurate prediction

Method

To solve this problem, we can create machine learning approach to predict the monthly rent of an apartment using various regression models.

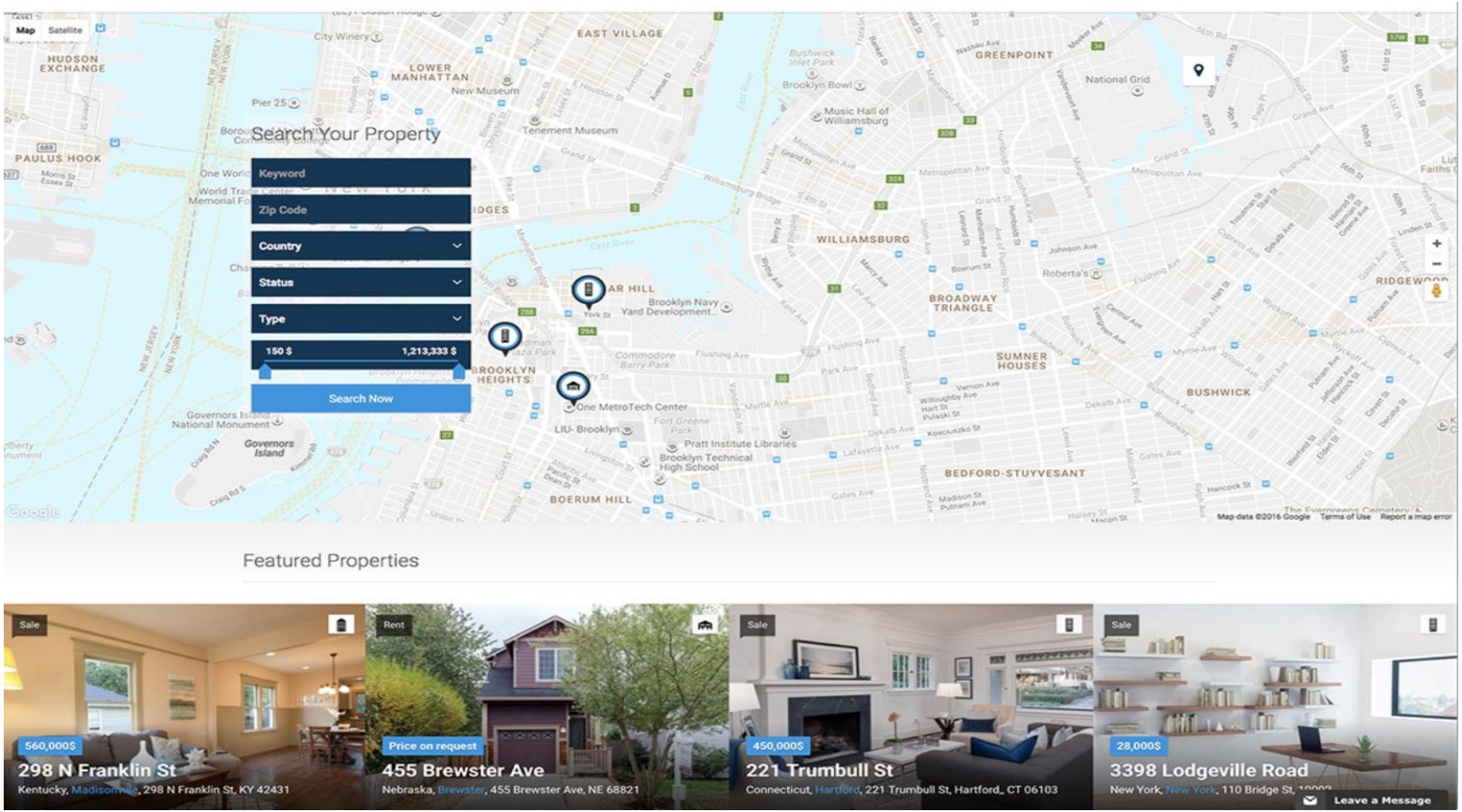
Python packages: sklearn, statsmodels

Random Forests (Breiman, 2001; Geurts et al., 2006)



1. Select appropriate number of features
2. Splits dataset into training sets and test sets
3. Train model using lasso, random forest, logistic regression
4. Use Recommendation Engine to give recommendations based on users' preference

Expected Result



Reference

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Thank You