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Code for Miami

Microsoft + DataKind AI in
Cities Virtual DataDive

October 6th, 2019

The Project Partner

- Miami motivates developers to build affordable units through monetary incentives. What about by **making the process itself better**?

- Miami has partnered with **Code for Miami**, which aims to make the application process for developers faster and better.
  - Code for Miami has built gethousing.org to map existing units for developers, the city, and residents in order to explore affordable housing.
  - Code for Miami goal: Developers can digitally track the status of their applications and fulfill any requests by the city to amend them.

CHALLENGE

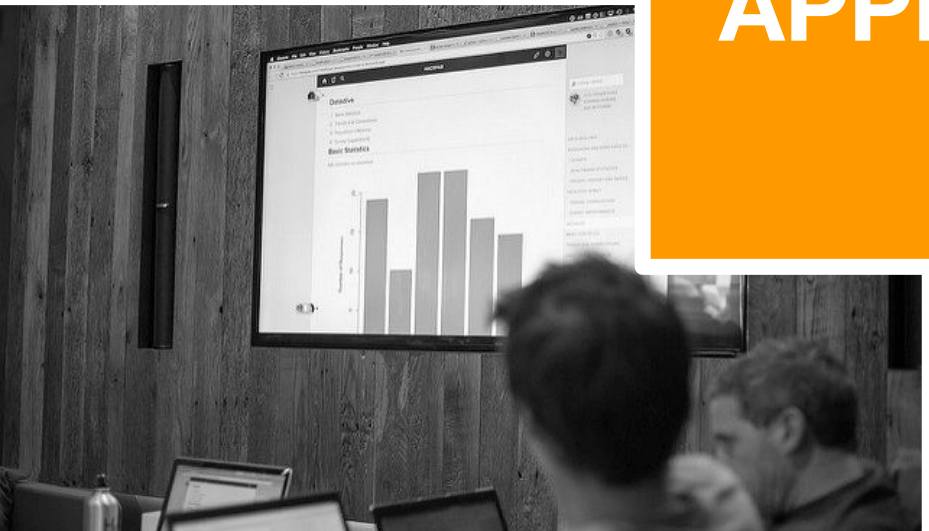
Challenge

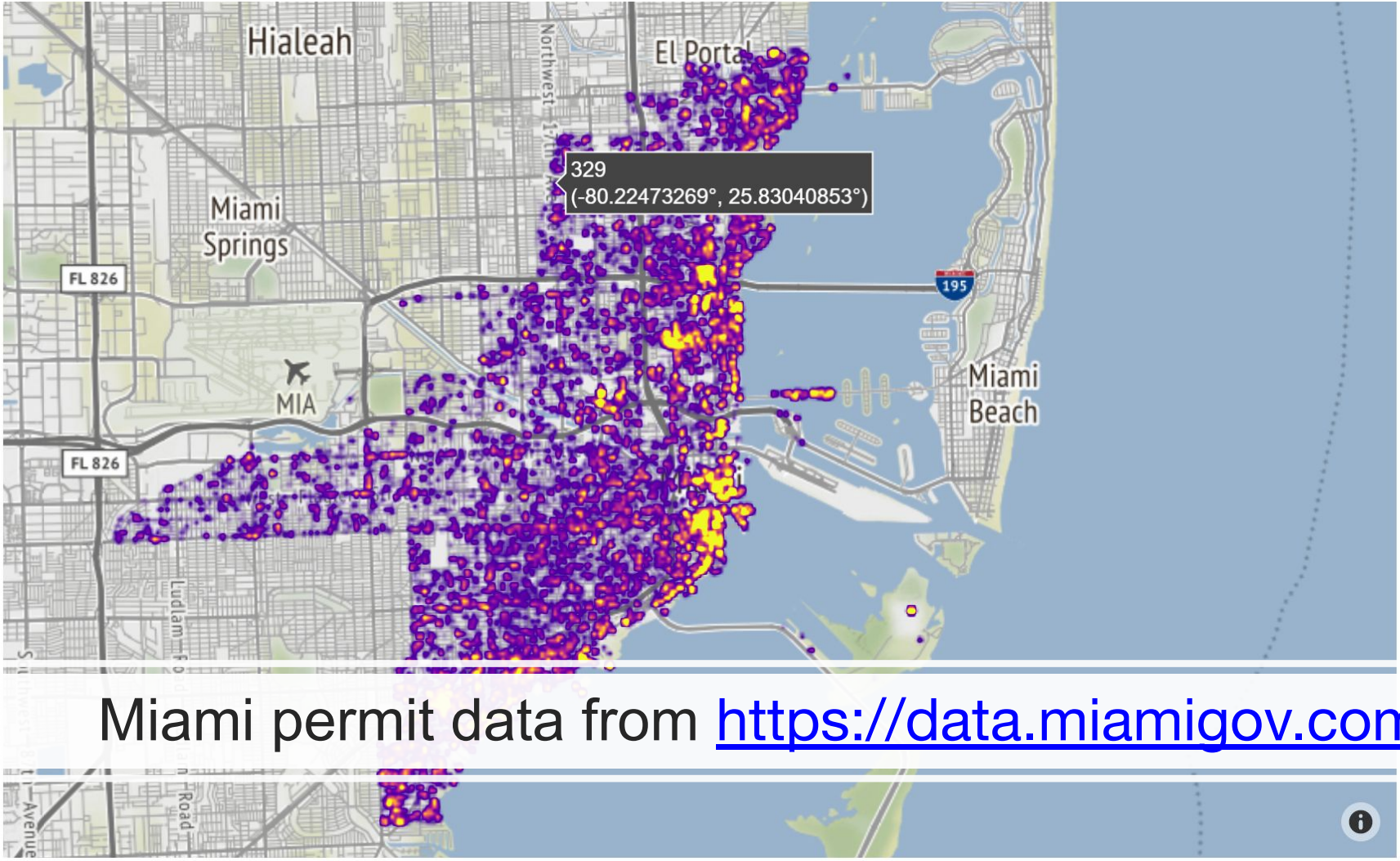
- The challenge Show how AI can be applied to make the process of applying to create affordable housing **more transparent and user-friendly** for housing developers in Miami.

- Reduce friction and frustration for them during the application process by **predicting how many days their application and plans will be in review**.

- Stand up a **real-time API** to provide days-in-review predictions based on available data after application and plan submission, but before plan approval, for the web site gethousing.org to consume and display to users (applicants).

APPROACH





Miami permit data from https://data.miamigov.com/

Approaches

Data was in really good shape! Thank you, Miami!

Decided to focus on predicting days-in-plan-review from:

- Property type: residential, commercial
- Total square feet: numeric
- Is private provider: boolean
- Scope of work, categorical
- Total cost, numeric

150k rows, 25 columns, very few malformed fields

Approaches

ScopeofWork
NEW CONSTRUCTION
ADDITION AND REMODELING
NEW CONSTRUCTION
BUILDING ROOFING
BUILDING ROOFING
REMODELING/REPAIRS
PLUMBING
REMODELING/REPAIRS
DEMOLITION
REMODELING/REPAIRS
REMODELING/REPAIRS
NEW CONSTRUCTION
BUILDING ROOFING
REMODELING/REPAIRS
REMODELING/REPAIRS
NEW CONSTRUCTION
REMODELING/REPAIRS
DEMOLITION
NEW CONSTRUCTION
ELECTRICAL
TREE PERMIT
MECHANICAL

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FINDINGS

Key Findings

We extracted some insights from the data

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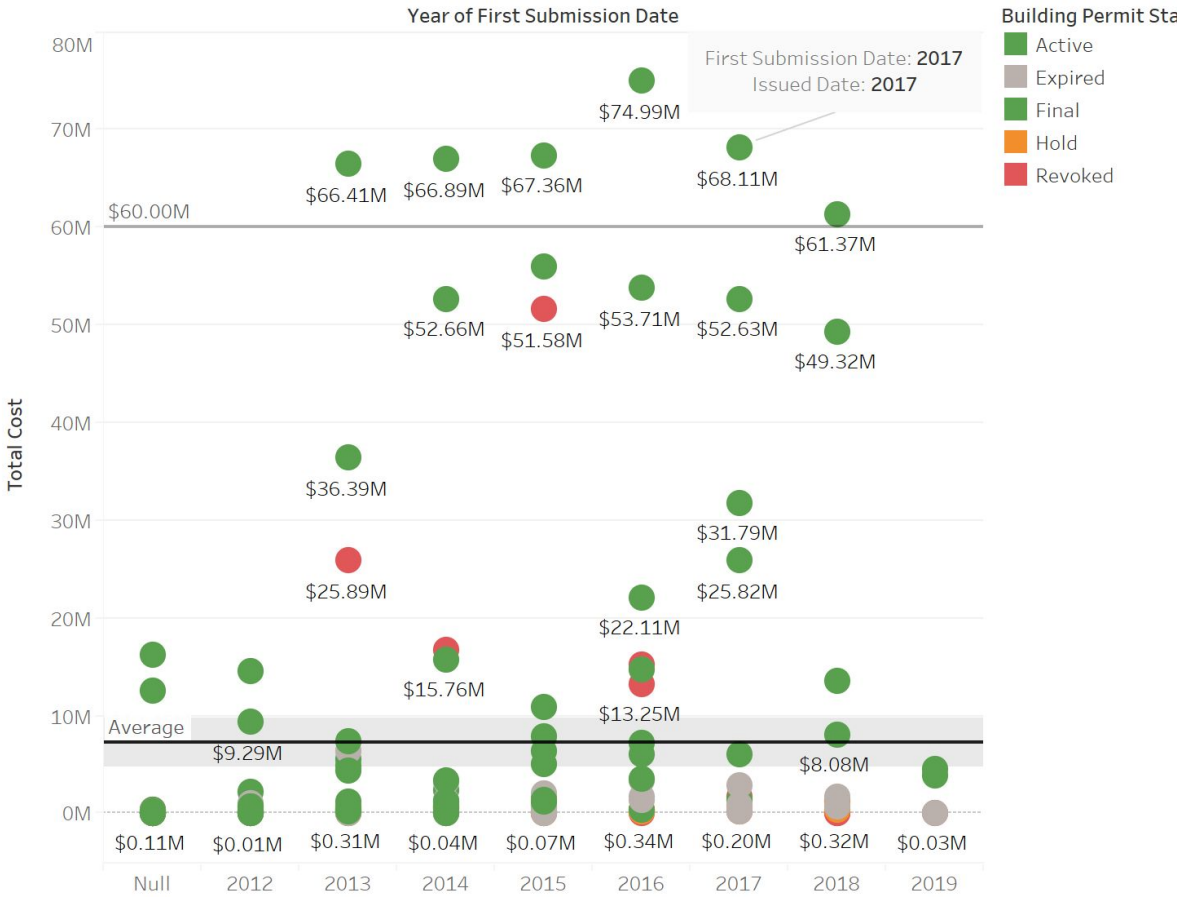
For Residential properties

Total Project Cost from first submission to permit issue date distribution

Total Projects costs above 60M, permites are approved in same year



Key Findings

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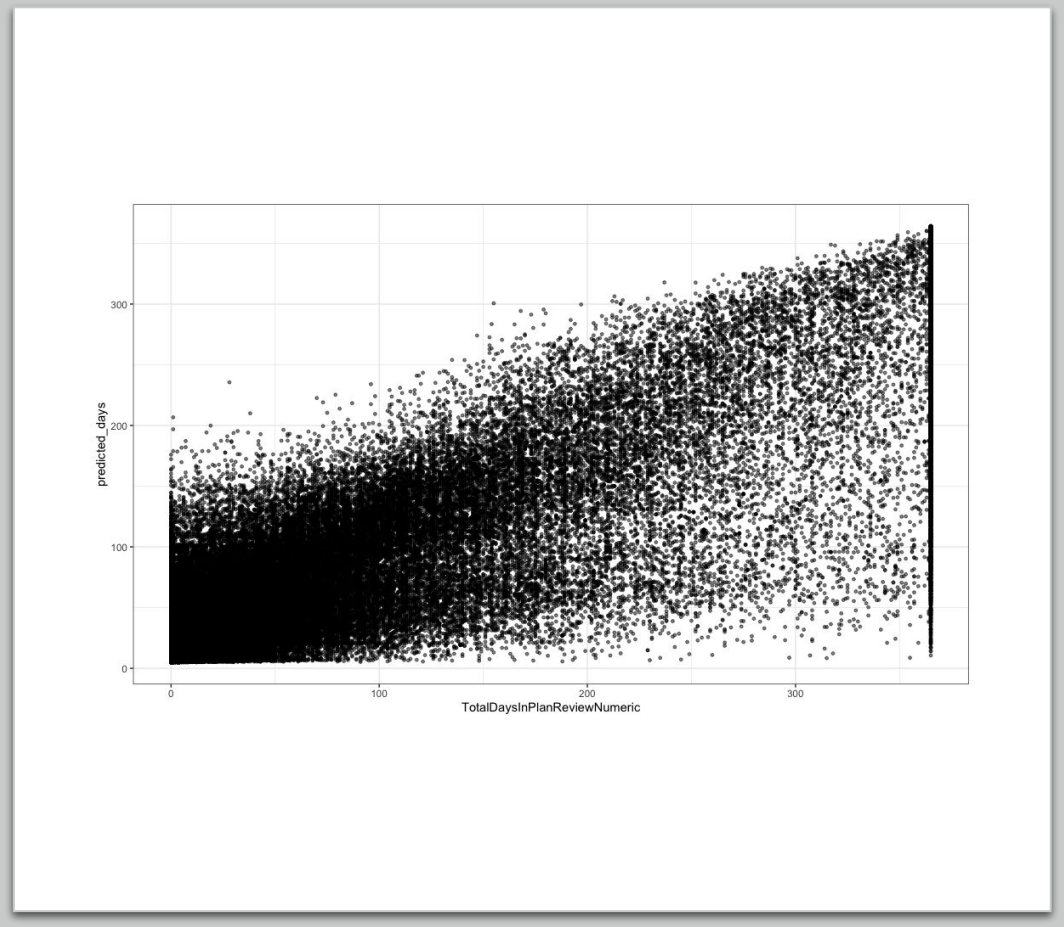
Key Findings

We trained

- linear models (**r-squared 0.1-0.5**)
- gradient boosted decision trees (**r-squared 0.5**)
- random forests (**r-squared of 0.5-0.62**)



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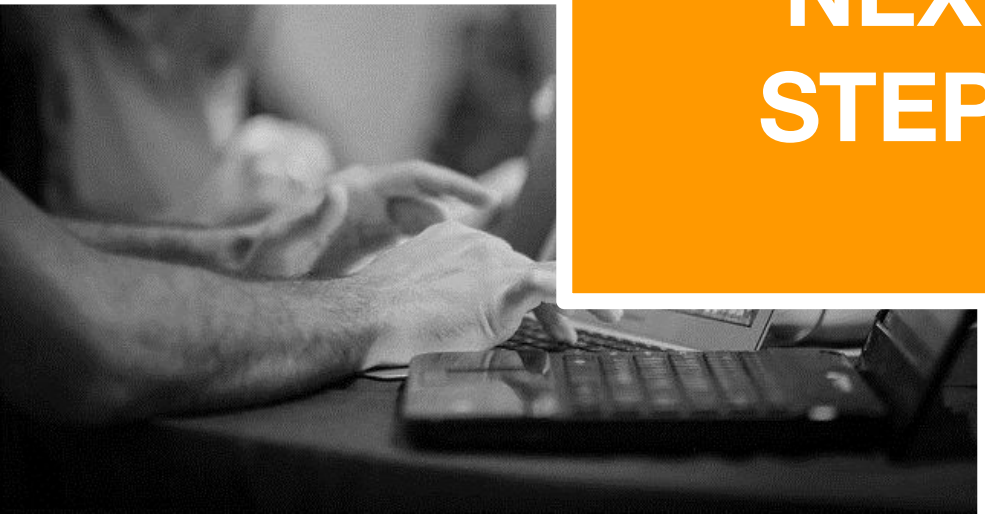
NEXT STEPS



Next Steps

- Tell Miami about these great results!
- Finish and harden the **API service**, and stand it up on a more permanent server
- Add in **more features** (columns, covariates) as appropriate
- **Explain** why days-in-review predictions come out high or low to end-users

The DataDive team

- Data Ambassador Will High, partner Gregory Johnson, facilitator Rory Mealiffe, devops Michael Dowd
- Team:
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  - Anthony
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  - Jeff
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  - Shashank
  - Sridevi
  - Tarzia


WE
DATA