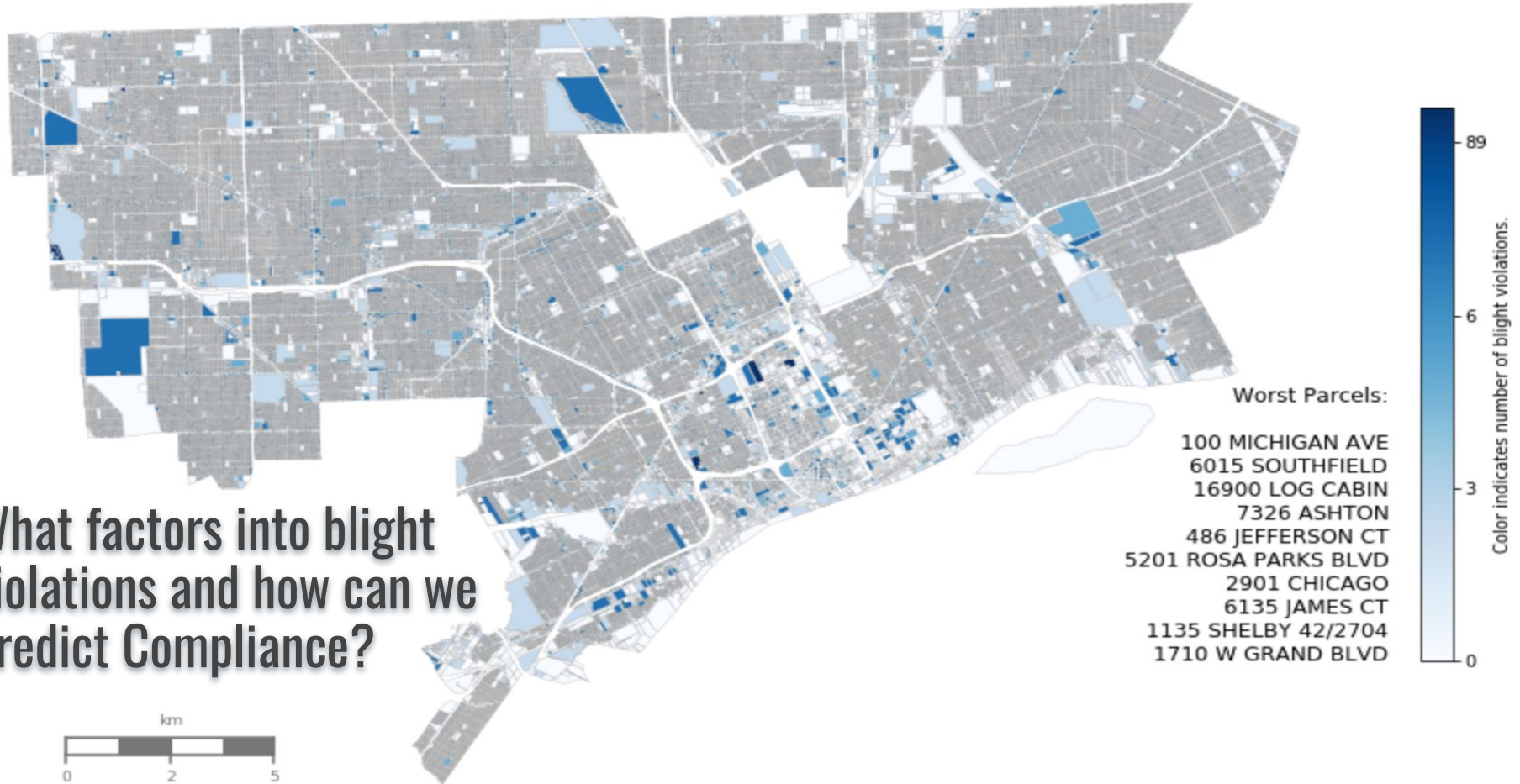


Blight Violations in the City of Detroit



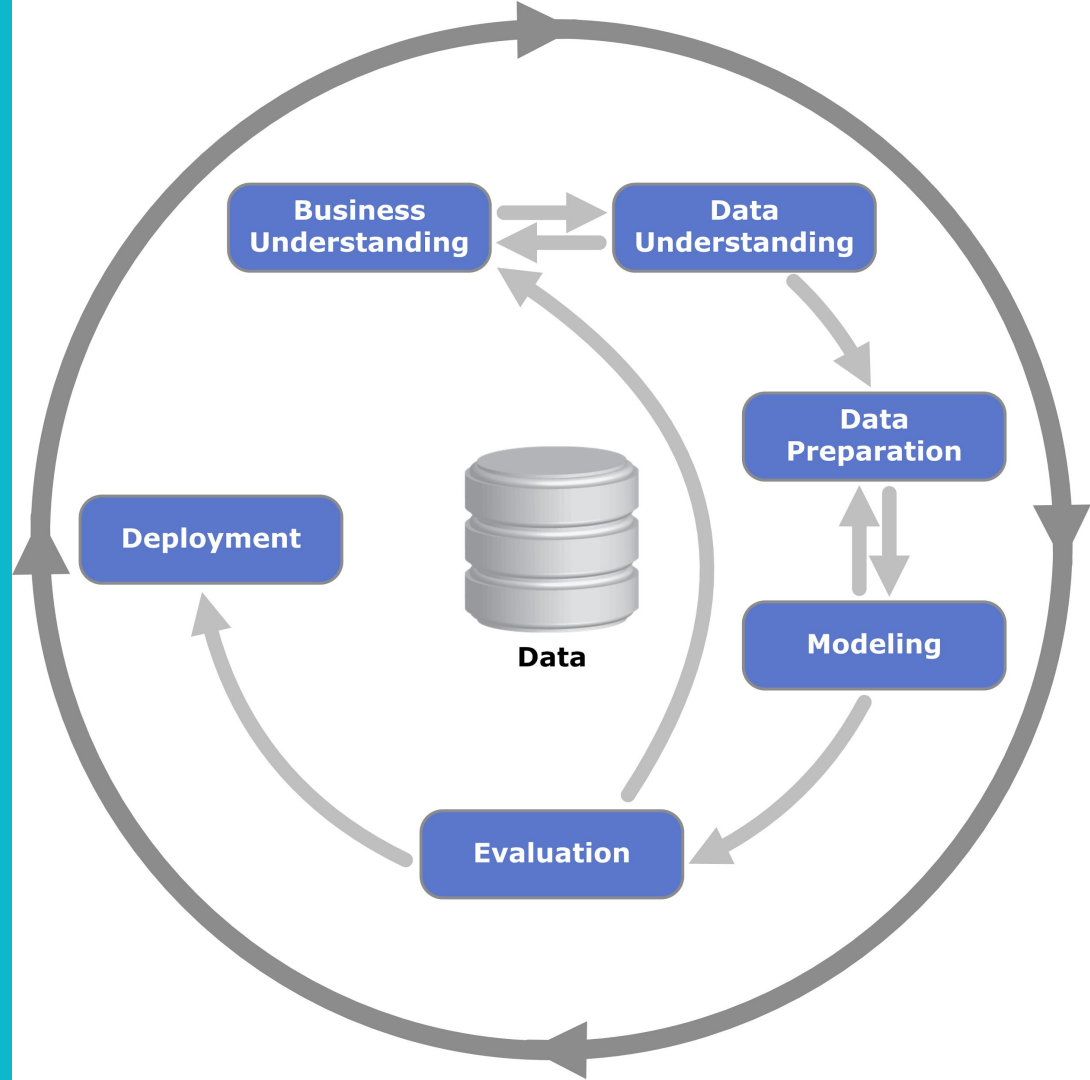
What factors into blight violations and how can we predict Compliance?



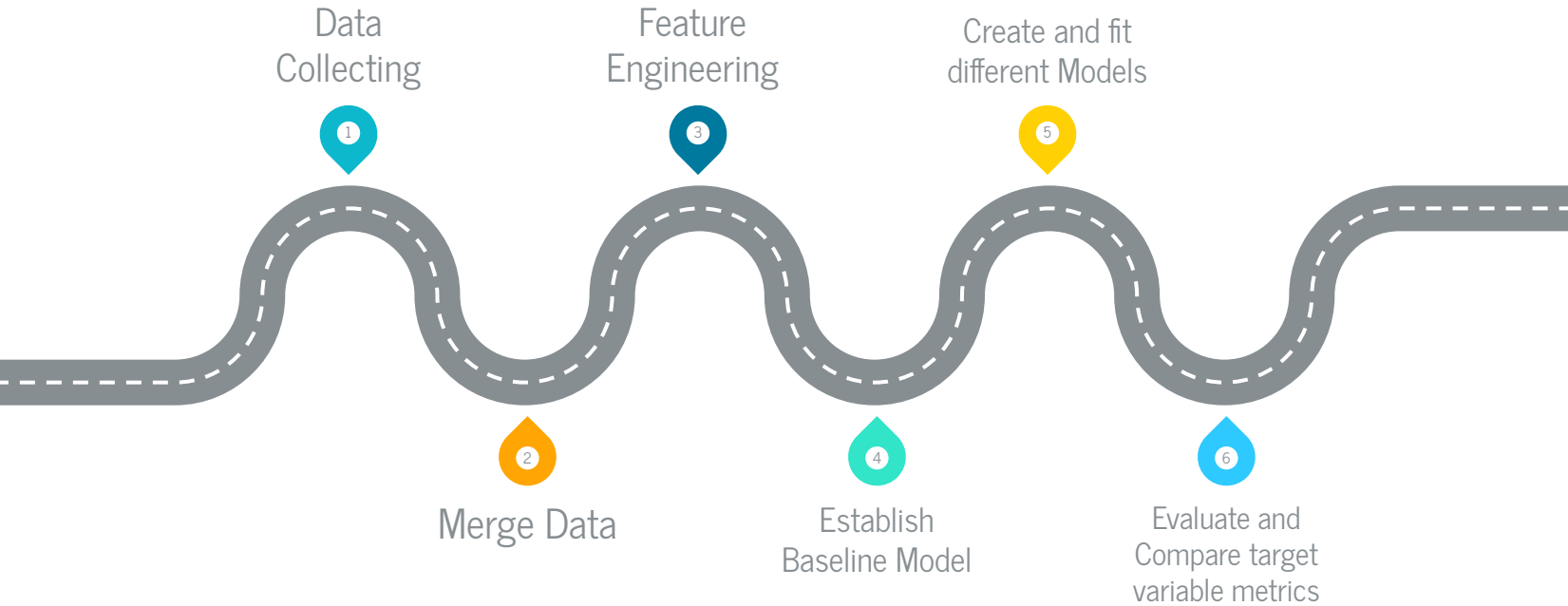
General Approach

*Based on Cross Industry Standard
Process for Data Mining*

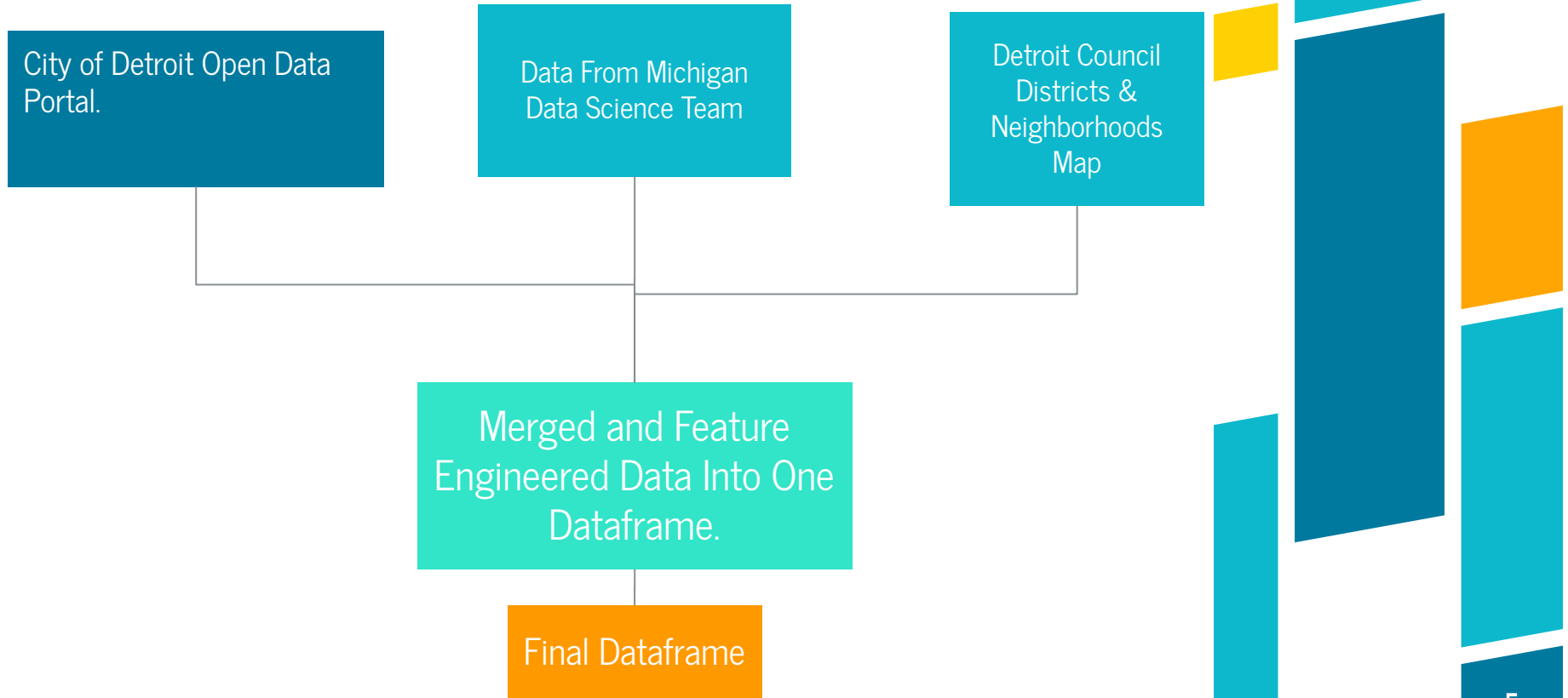
1. Look at the big picture.
2. Get the data.
3. Discover and visualize the data to gain insights.
4. Prepare the data for Machine Learning algorithms.
5. Select a model and train it.
6. Fine-tune your model.



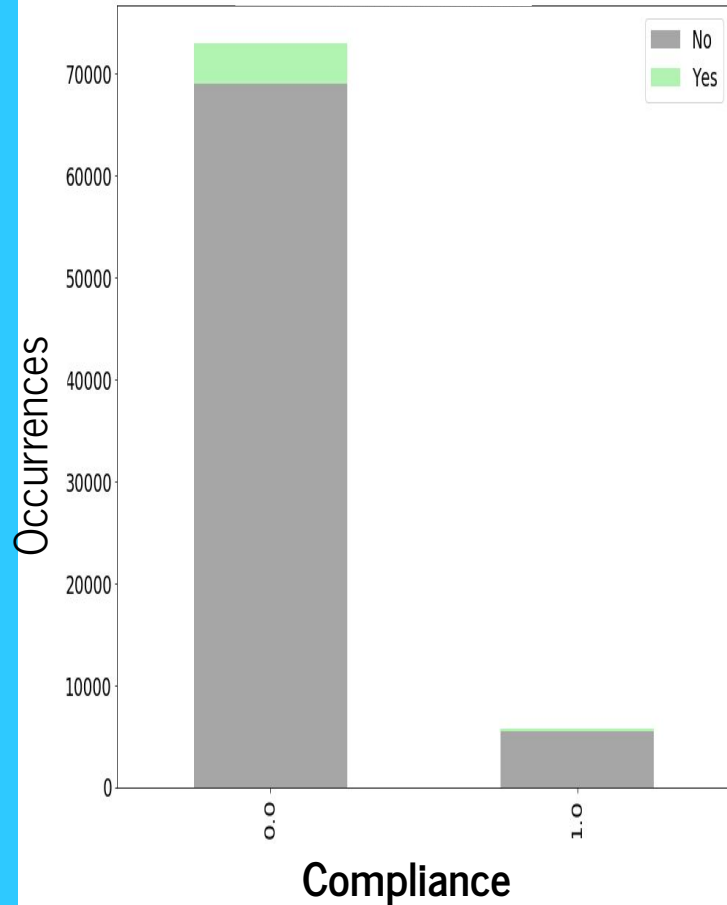
Process



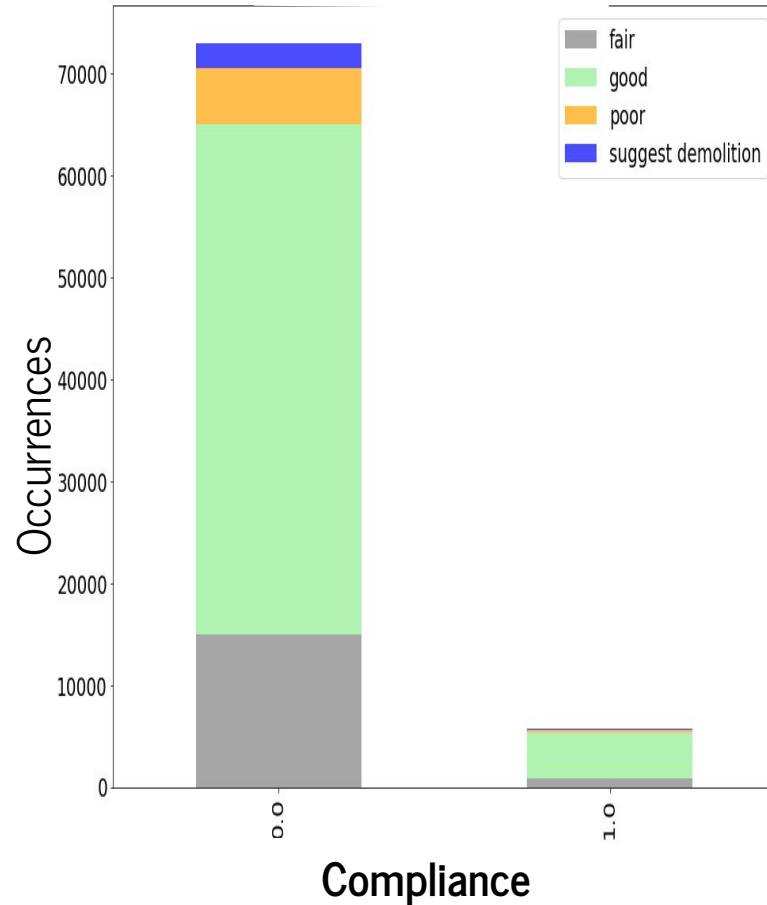
Data collection & Feature Engineering



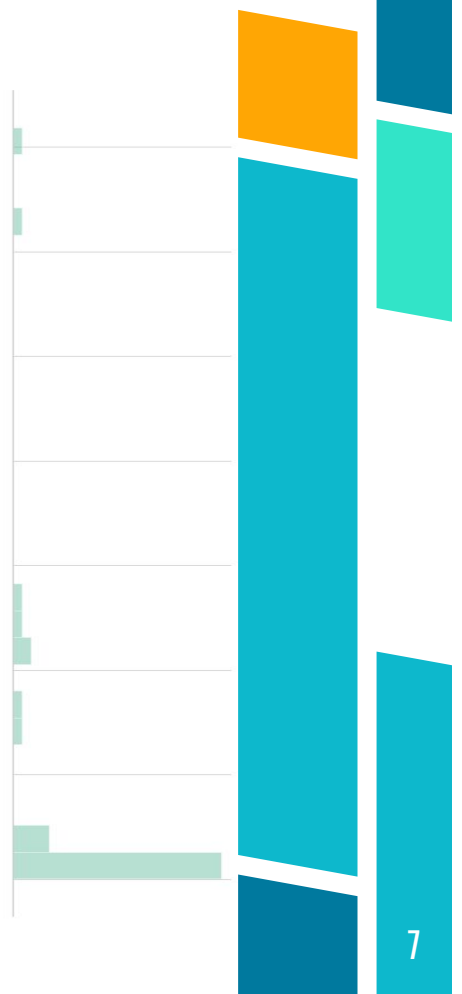
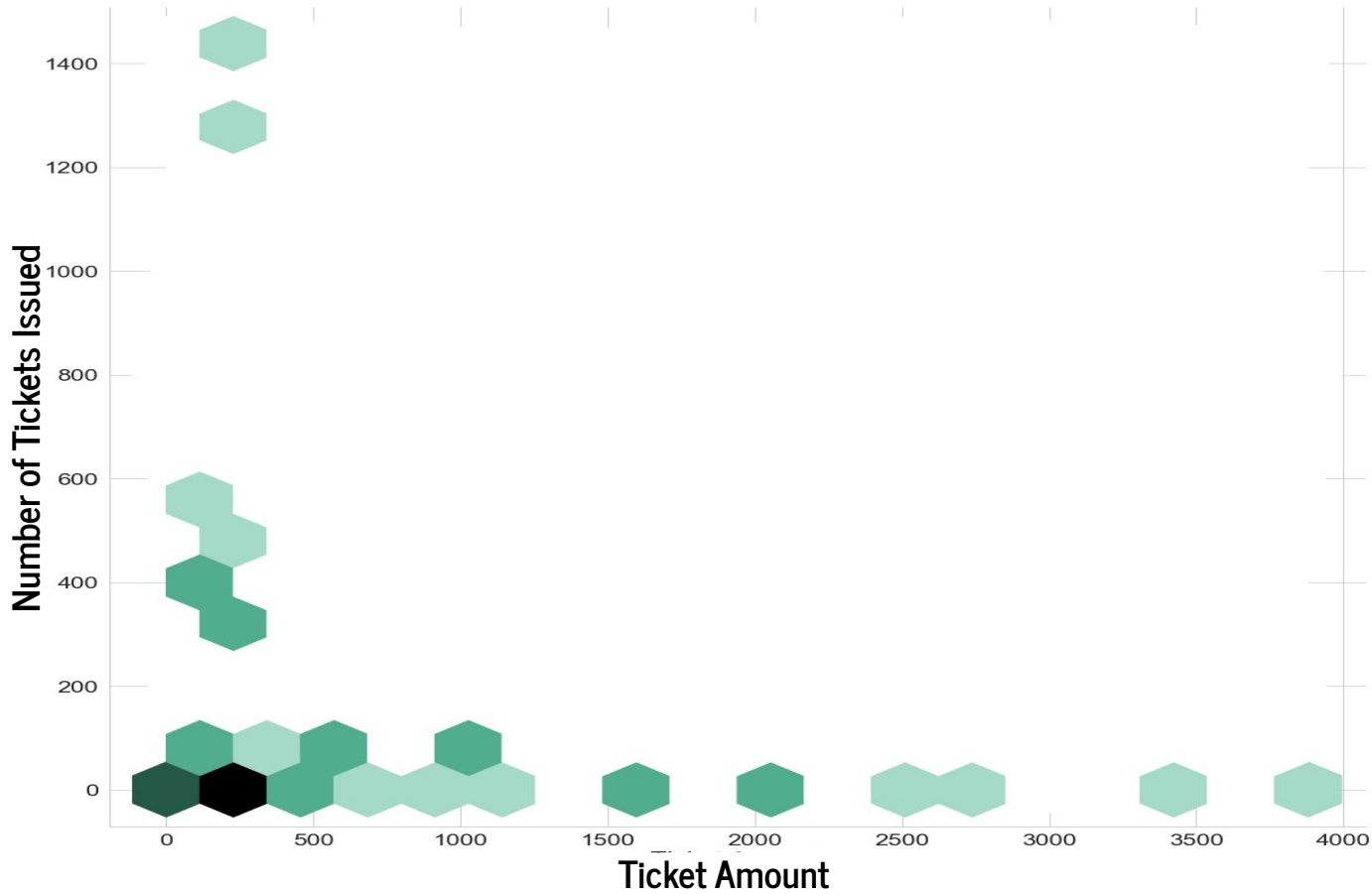
Fire at Site vs Compliance



Condition vs Compliance



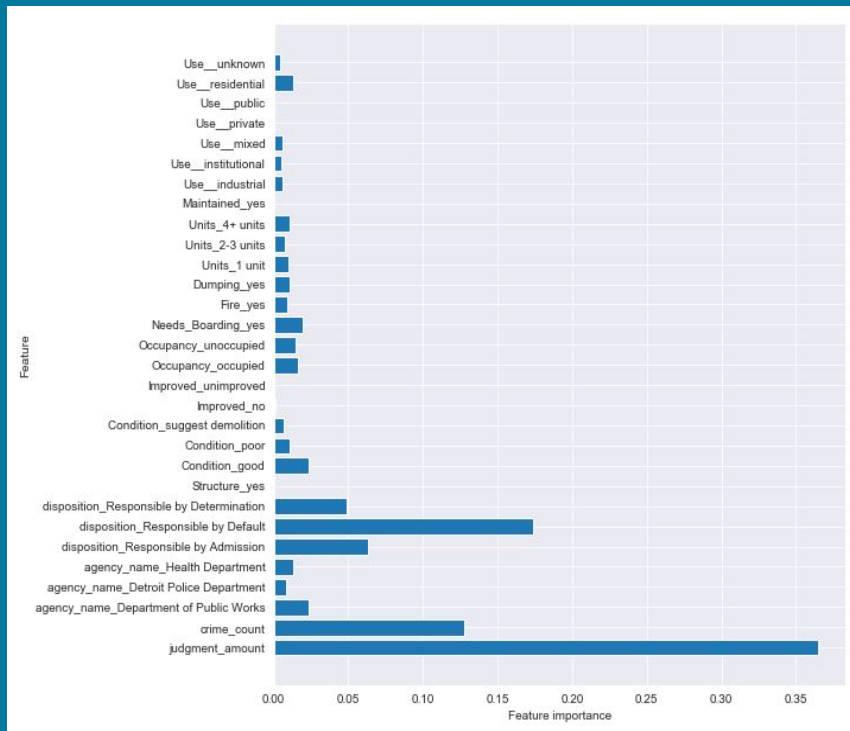
Number of Tickets & Ticket amount when Compliant



Building and Evaluation Models.

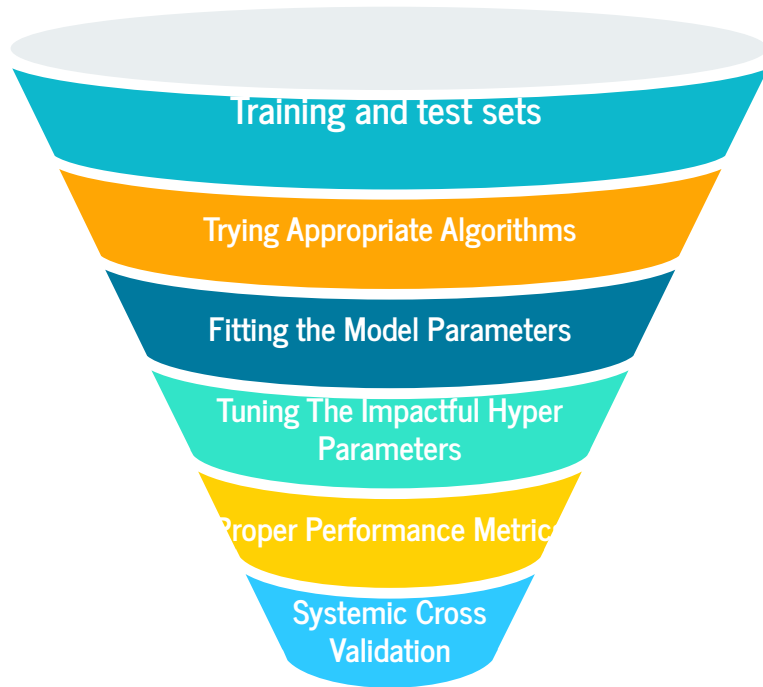
Using Scikit-learn package the following classification models were built and evaluated:

- **Logistic Regression.**
- **Logistic Regression with SMOTE.**
- **Decision Tree.**
- **Decision Tree with SMOTE.**
- **Random Forest.**
- **Decision Tree with GridSearchCV.**
- **AdaBoost and Gradient Boosting with Weak Learners.**



The best results was given by Random Forest and Gradient Boosting with feature importance on a right

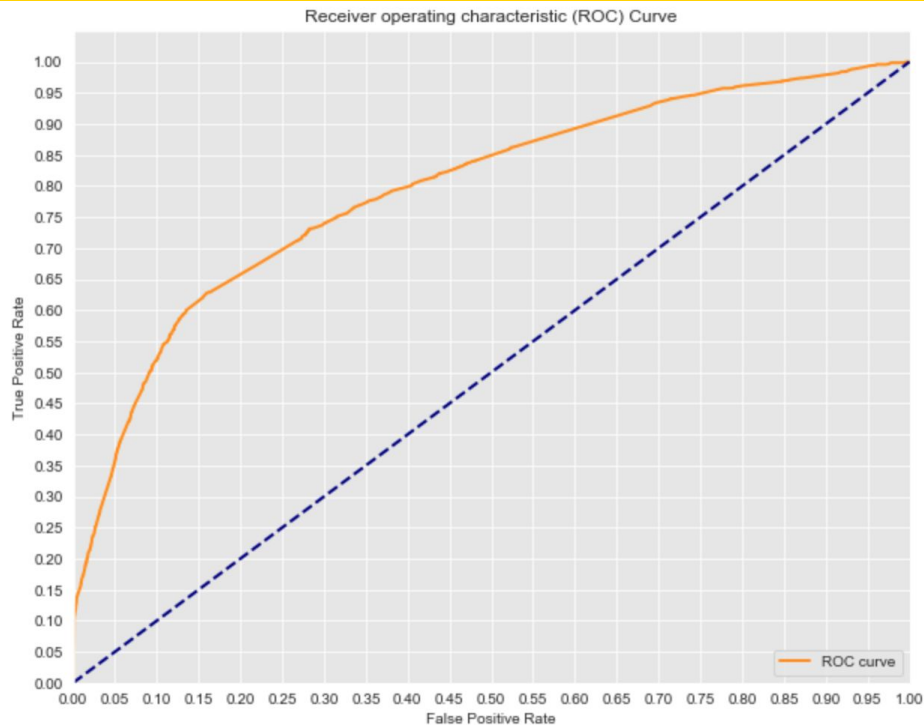
Implementing The Machine Learning Process



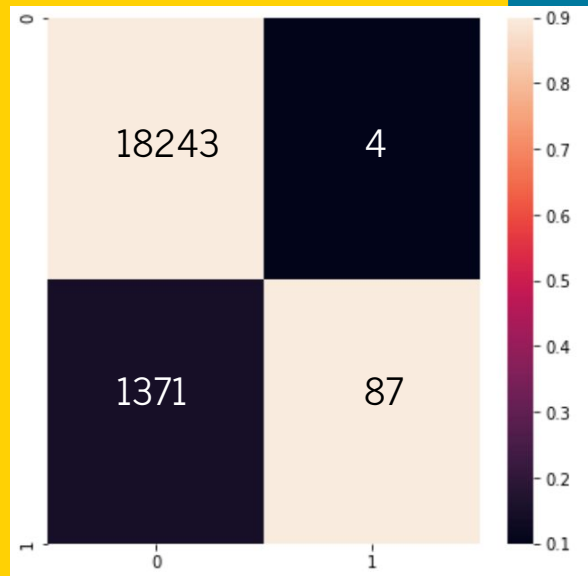
	<i>F-1 Score</i>	<i>Precision</i>
<i>Logistic Regration</i>	0.89	0.60
<i>Decision Tree</i>	0.92	0.61
<i>Random Forest</i>	0.93	0.89
<i>Gradient Bosting</i>	0.91	0.9
<i>Grid Search</i>	0.9	0.96

Final Model Results

AUC = 0.79



Gradient Boosting with Grid Searching



A photograph of a residential street featuring a row of historic houses. In the foreground, a concrete sidewalk runs alongside a grassy area with several large, leafless trees. The houses are multi-story, with one prominent house having teal-colored siding and white trim. The scene is captured in a slightly overcast, daytime setting.

Every Neighborhood

Has A Future...

Next Steps:

- Expand the Model to Predict Multi-class Target
- Bring More Data into Model from Outside Resources for Feature Engineering
- Try Different Models to Improve Evaluation Metrics

And It Doesn't

Include Blight

Presented By Ivan Zakharchuk & Kelvin Arellano



Kelvin Arellano

[Github](#)



Ivan Zakharchuk

[Github](#)