Sleepless in Seattle

An exploration of 911 emergency call data in Seattle, WA

Challenge

Emergency Responders have limited resources to address 911 incidents.

How to leverage 911 call data to predict and prioritize incident response?

911 Call Data

Dataset:

- Seattle Police Department 911 Incident Response 2010-16

Key Features:

- Clearance Event Code
- At Scene Time
- Beat-Zone

Targets (Attempted)

3 Targets of potential interest:

- Violent/Nonviolent
- False Alarms
- Clearance Time

Violent/Nonviolent proved most amenable to prediction

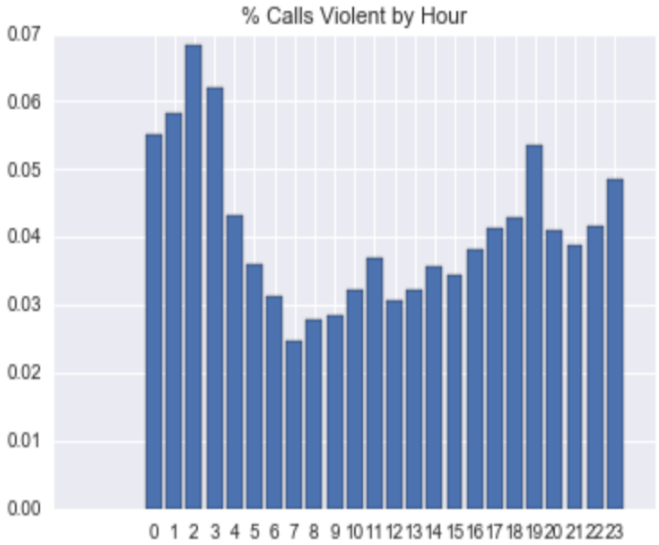
Predicting Violent Crime

Target: Violent Events (4%)

- Assault
- Homicide
- Armed Robbery
- Drive-by Shooting

Features

- Month
- Day of Week
- Time of Day
- Police sector



Favored Model

Logistic Regression (threshold = .04)

Accuracy: .60

Precision: .06

Recall: .57

Uses

Product: Web app

Predict violent / non-violent

Product: Call ranking system

Rank calls by priority (predicted probabilities)

APP

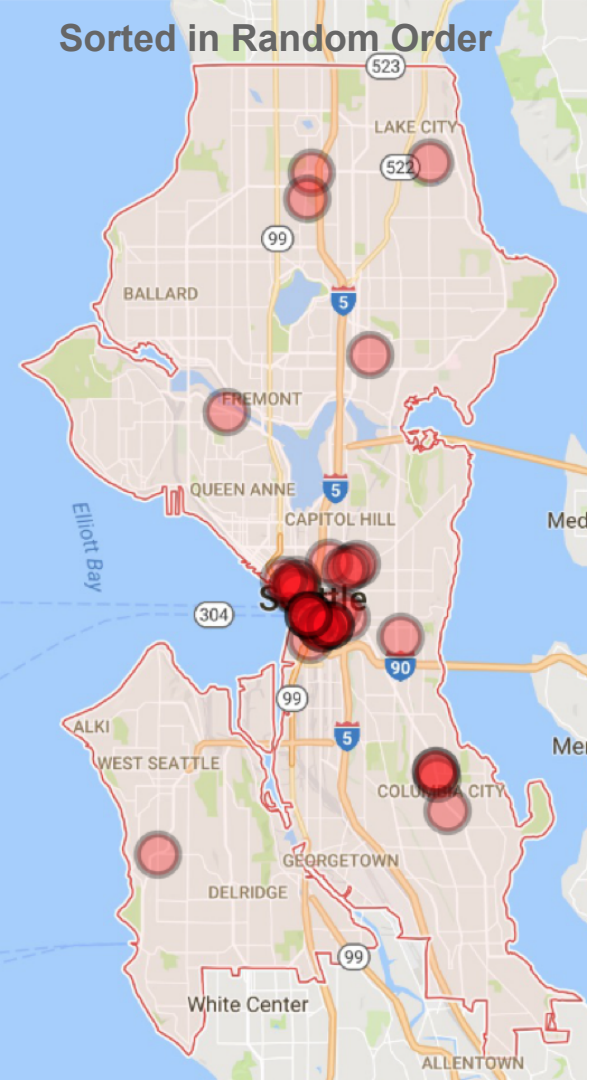
Real-Time Prediction of Violent Crimes

Predict whether a call is about a violent or a non-violent event

Logistic Regression Model

Use case: Prioritize violent crimes during high call volume times

Live-demonstration available



Call Ranking Demonstration

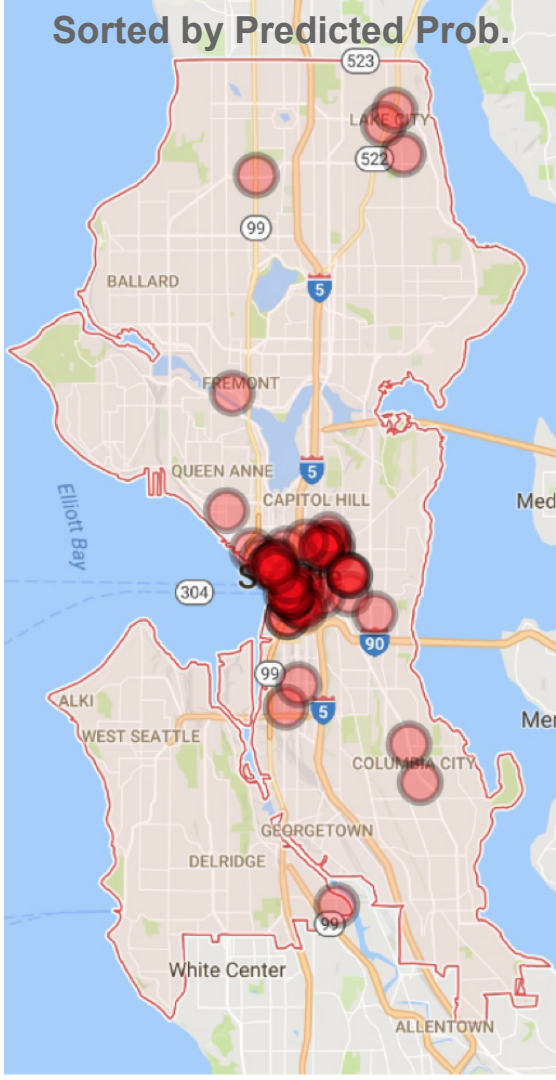
Random Sort:

35 of **70** true violent events in top 50%

Logistic Regression:

52 of **70** true violent events in top 50%

Total of **2,113** calls from the week Oct-26-2015 to Nov-1-2015



Thank you!

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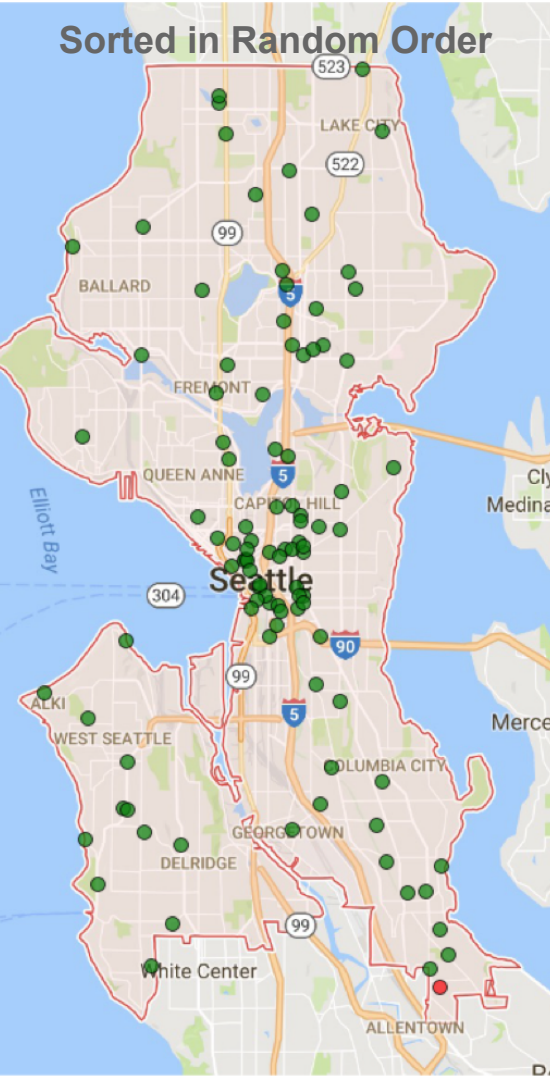

Report Ranking Demonstration

Random sort:

1 of 39 true violent events in top 10%

Gradient Boosted Trees:

33 of 39 true violent events in top 10%

Violent
Nonviolent

Random sample of 1,000 calls