



by Instinct



University of  
Southern California



University of Illinois  
Urbana Champaign



Indiana  
University



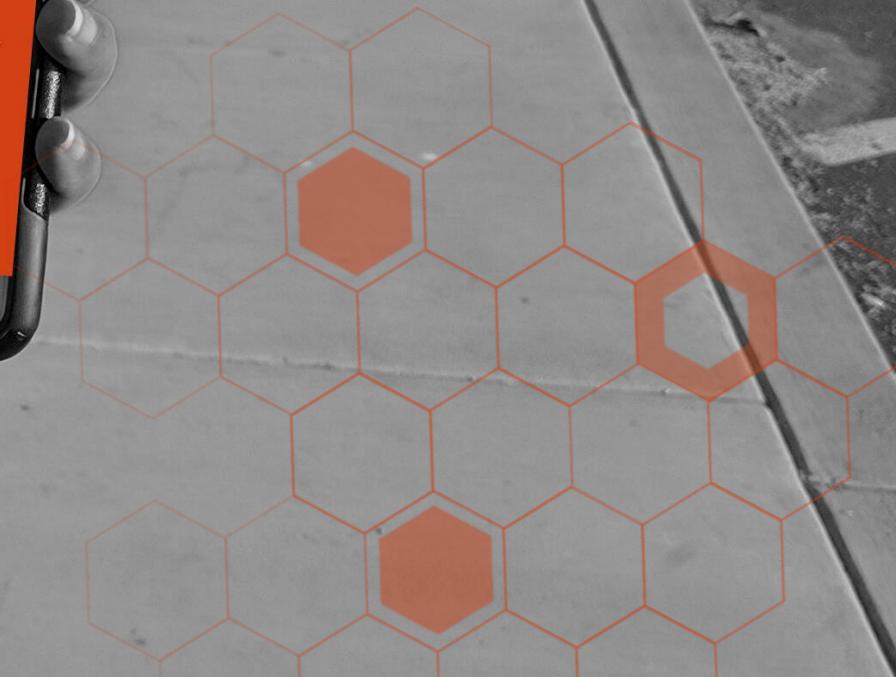
University of  
Buffalo



*"The true promise of crime mapping lies in its ability to identify early warning signs across time and space, and inform a proactive approach to police problem solving and crime prevention."*

-Elizabeth R. Groff, National Institute of Justice and Nancy G. La Vigne, The Urban Institute

Why are we predicting crimes?





Why  
Crimecast?

## Scenario 1

A black and white photograph of a woman from behind, looking down at her smartphone. She has long dark hair and is wearing a light-colored top. The background shows a path covered in fallen leaves. Overlaid on the image is a hexagonal grid pattern in orange. Several hexagons are filled with a darker shade of orange, highlighting specific areas of the grid.

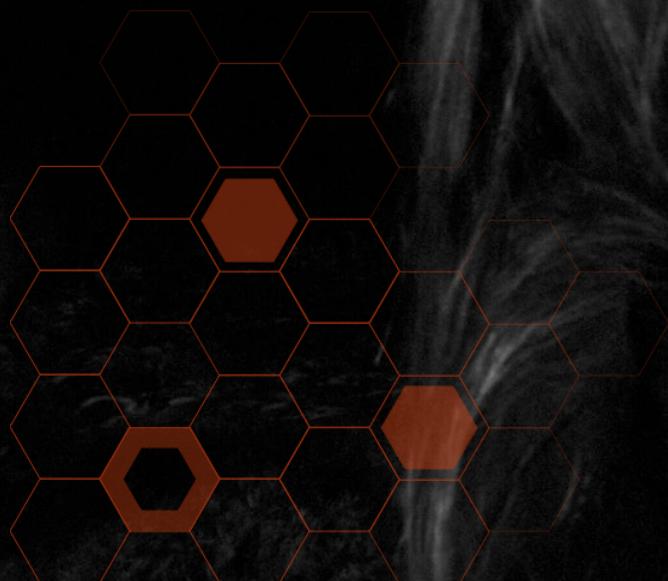
You realize that you've wandered really far away from your house. The area is unknown. **What kind of a place is this?**

It's a new place.  
You are unaware.  
Could  
something  
happen here at  
this time?



Scenario 2

# Scenario 3



Is it a one time occurrence? Did something happen here before? Could something happen tomorrow?



# NO



Information about the place

Awareness about what could happen in the **next few hours**

Knowledge about what happened earlier



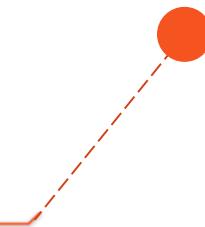


Information



Data driven:

Provides predictive insights to see the future with data-reinforced accuracy





Information  
Awareness



## Data driven:

Provides predictive insights to see the future with data-reinforced accuracy



## Crime Forecasting:

Uses machine learning and visualization to create awareness about the crime trends at a time

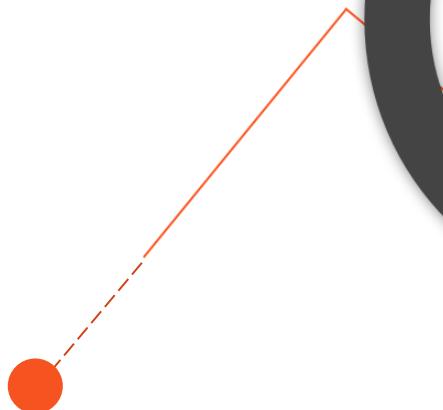


Information  
Awareness  
Knowledge



## Crime Mapping:

Analytical tool that informs users about the type of crime that occurred/can occur at a place



## Data driven:

Provides predictive insights to see the future with data-reinforced accuracy



## Crime Forecasting:

Uses machine learning and visualization to create awareness about the crime trends at a time

# 12

Location-Sensitive  
Crime Categories

## Data Source

San Francisco City and County

# Data Cleaning

R-ArcGIS Bridge

700,000

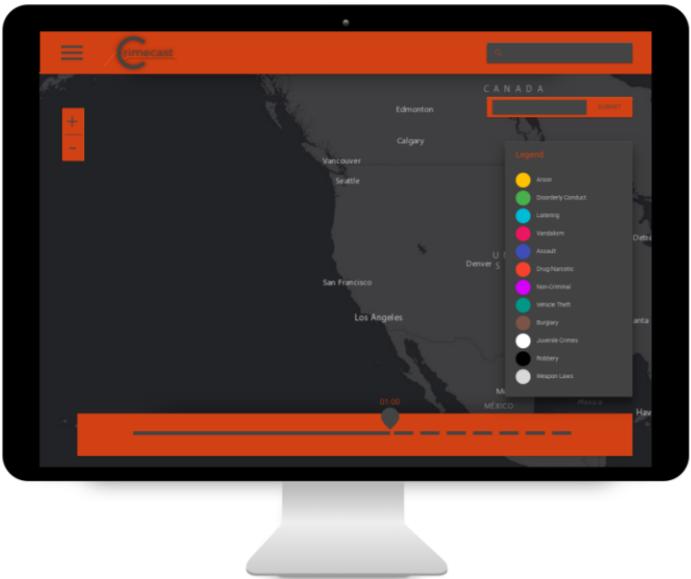
Data Points

# Technology



## <Prediction>

- Bernoulli's Naïve Bayes Algorithm



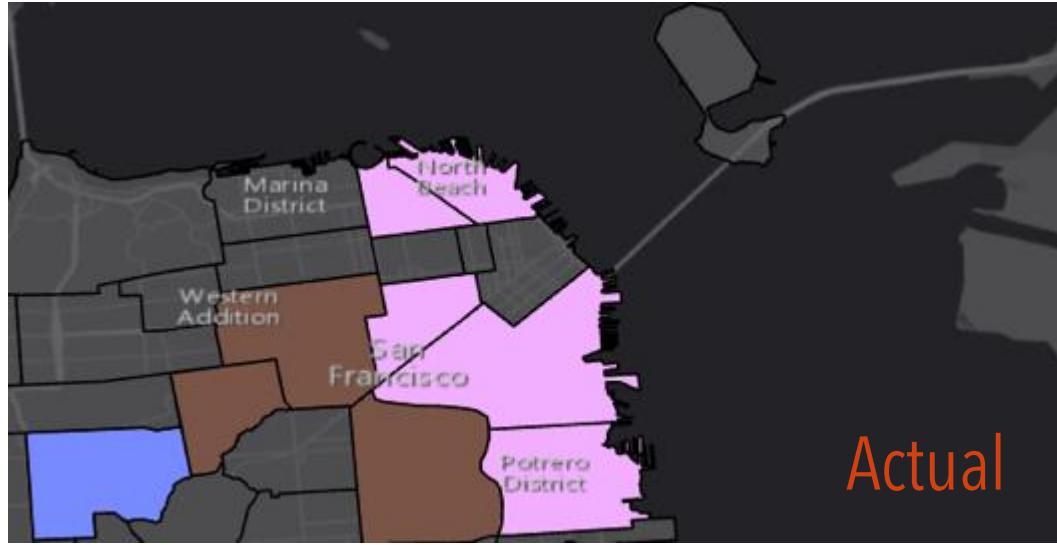
Web App

## <Visualization>

- Arc GIS Pro
- Arc GIS Online
- ArcGIS JS API

# Demo

# Validation

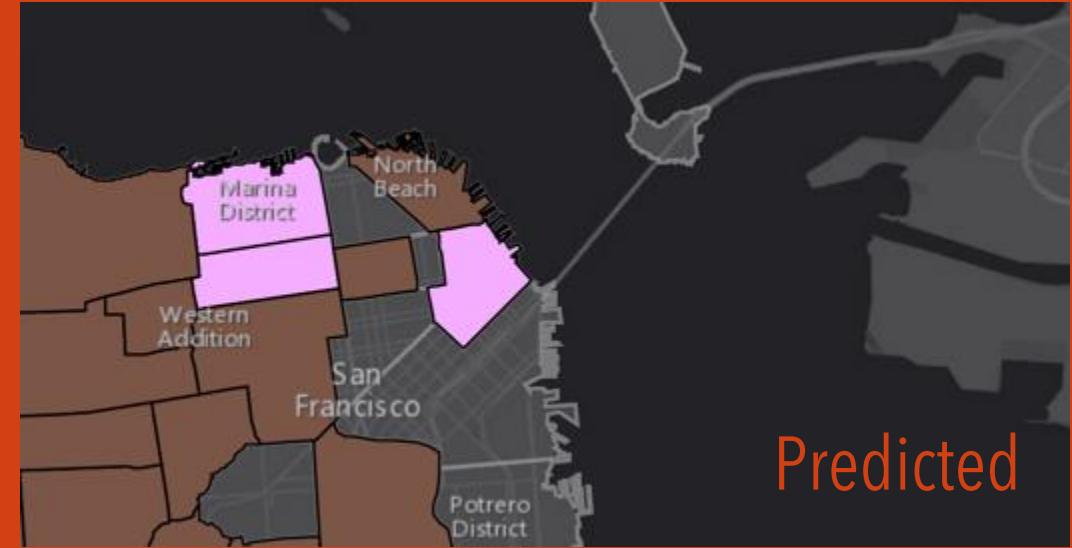


Actual

Jan 05, 2016 between 1-2 PM

Crimes Occurred:

Non-Criminal  
Robbery  
Assault



Predicted

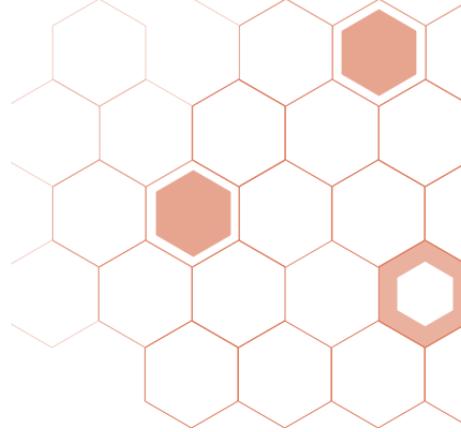
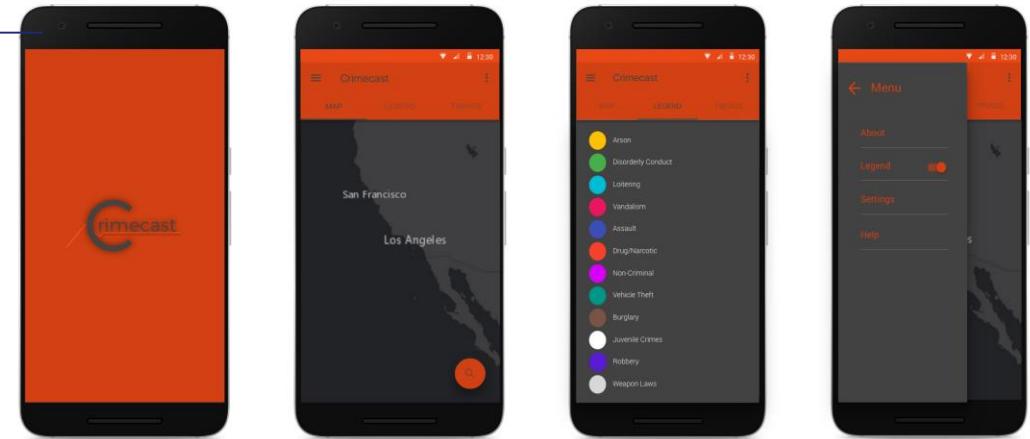
Jan 05, 2016 between 1-2 PM

Crimes Predicted:

Non-Criminal  
Robbery

## Cross Platform Implementation

To port the application to other platforms



## UX Improvement

Polish the in-app experience, add 'About' and other help patterns

## Data Segregation

Converting data neighborhoods to smaller hexagons to increase accuracy

Future Work for Crimecast



The Developer | Implemented  
the web and mobile app



The GIS Expert | Cleaned the  
data and created datasets



The Designer | Designed the UI  
and logo and graphics for the  
presentation



The Marketer | Created the  
content and the presentation



The Developer | Implemented  
the web and mobile app

Questions?

A decorative graphic in the bottom right corner consisting of a grid of red hexagons of varying sizes, creating a hexagonal lattice pattern.



Understanding our world.