DATA FOR GOOD COMPETITION

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OAKLAND CRIME PREDICTION APP

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Problem Overview

Oakland is notorious for having one of the highest crime rates in California. Local government has made a lot of progress reducing crime rates over the last five years but the crime rates still are among the highest in California. Our team plans to develop an app for citizens to:

1. Prevent crime through increased crime awareness.
    a. Our app, the Oakland Crime Prediction App, will provide crime predictions, enabling citizens to be more crime-aware when they make decisions. The crime predictions will also encourage community discussion and involvement. To facilitate community involvement, our app will also serve as a platform for community discussions. We will then use input from this platform to improve our crime predictions.
2. Partner with experts and businesses (IOT companies such as Nest) to develop programs for interested communities to improve monitoring and reduce crime

Problem Severity

A recent FBI crime report shows Oakland is among the highest crime-ridden cities in the Bay Area, with 6,059 violent crimes and 23,952 property crimes. San Francisco has a similar number of violent crimes and twice as many property crimes, but twice as many residents.

FBI BAY AREA CRIME REPORT

The FBI Uniform Crime Report for 2016 shows that Bay Area cities often outpaced the national average increase in violent crime from 2015 of 4.1 percent. Many cities saw a drop in overall property crimes, which decreased 1 percent nationally.

	Violent crime		Property crime	
City	Total crimes	Percent change	Total crimes	Percent change
Fremont	420	**+24.6%**	4,715	**+7.9%**
San Jose	3,887	**+14.3**	24,749	-1.1
Berkeley	602	**+13.6**	5,420	-8.2
Hayward	631	**+13.5**	4,641	**+3.5**
Palo Alto	73	**+7.4**	1,436	-15.7
Daly City	244	**+4.3**	1,631	-8.3
Santa Clara	159	**+1.9**	2,814	-21.4
Oakland	6,059	**+0.1**	23,952	-2.5
Sunnyvale	158	0.0	2,140	-9.1
Antioch	760	-1.4	3,690	-5.7
San Francisco	6,190	-7.7	47,402	-10.6
Concord	447	-9.0	4,337	-6.1
San Mateo	242	-9.0	2,141	**+4.7**
Walnut Creek	78	-14.3	2,120	-16.5
Los Gatos	21	-32.3	616	-12.1
Richmond*	1,019	N/A	3,785	N/A

*Richmond did not have 2015 figures registered in the 2015 FBI UCR data.

Source: FBI Uniform Crime Report 2016, Bay Area News Group

BAY AREA NEWS GROUP

Unique Value Proposition

The target audience of the Oakland Crime Prediction App is Oakland residents.

The Oakland Crime Prediction App will increase citizens' crime awareness in the following ways:

1. Predict crime so citizens will better understand their crime risk.
2. Educate citizens on how to predict crime (by communicating to citizens key crime predictors).
3. Provide a platform for community discussion and involvement to prevent crime.

The app will also enable police to engage with citizens by providing a platform to communicate real-time alerts.

Currently, there is no crime prediction app geared towards citizens. PredPol is "predictive policing" software that some police departments use and praise. Tim Birch, Oakland PD's head of research and planning, considered implementing PredPol in 2015, but decided against it because it could lead to even more disproportionate stops of minorities and erode community trust. "Maybe we could reduce crime more by using predictive policing, but the unintended consequences [are] even more damaging… and it's just not worth it," Birch said. [1]

The Oakland Crime Prediction App seeks to reduce crime without these unintended consequences by promoting community engagement as opposed to increasing police patrols. The Oakland Crime Prediction App will be open-source and the data inputs will be from publicly available data to encourage algorithmic fairness discussions and actions.

Data Sources

Our team plans to utilize the following data sets and has reached out to community leaders to discuss adding data sets.

Data Source & Description	**Frequency**
Oakland PD Crime Data ftp://crimewatchdata.oaklandnet.com/	Daily
Oakland PD Calls for Service Data http://mapgis.oaklandnet.com/callsforservice/	Daily
Other Data: Yelp, Socio-economic data	TBD

[1] Thomas, Emily. "Why Oakland Police Turned Down Predictive Policing." Motherboard, Vice, 28 Dec. 2016, motherboard.vice.com/en_us/article/ezp8zp/minority-retort-why-oakland-police-turned-down-predictive-policing.

Output

The Oakland Crime Prediction App will provide citizens with an easy to understand visual representation of crime predictions, predictors, and trends. The views will be customizable based on location, type of crime, and risk severity.

The app will also provide a framework for residents and police to effectively communicate.

Project Plan & Timeframe

Activities	Timeline	Outcome
Focus group interviews - Oakland residents - Oakland PD - Warren Institute, UC Berkeley Law	Feb-Mar	Detailed summary of feedback and requirements
Historical Data Analysis - Data acquisition & normalization - Feature engineering, analyzing key predictors - Build predictive model	Feb-Mar	White paper detailing process and predictive model effectiveness
Data Visualization Prototype - Develop initial visualizations and interface - Review mockups with residents and collect feedback to make improvements	Mar	Develop web page with data visualizations
Crowdsourcing	Mar	Develop outline on how to crowdsource crime data from residents
IOT Monitoring	Mar	Develop partnership ideas with IOT companies to offer services for Oakland communities

Privacy Risks and Social Harms

The Oakland Crime Prediction App will be open-source and the data inputs will be from publicly available data to encourage algorithmic fairness discussions and actions. To maintain privacy, predictions will be at the block level as opposed to specific address level. Certain incident types (e.g. domestic violence, suspected abuse) are excluded in calls for service data to protect victims.