

Lab1: Descriptive Paper of ODU Spring 2019 CS411 Team Silver Project
Crime HotSpot

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1. Introduction

Description of crime mapping and Crime HotSpot.

- The need for publicly available crime mapping software
 - Personal Safety
 - Hearsay vs fact-based knowledge concerning crime

Background of what the current problem is:

- Differentiating violent crimes from nonviolent crimes
 - Difference between crimes occurring and the risk of crime impacting user
- Cluttered interface/information overload

Characteristics of an ideal solution:

- Provides context to data
 - Crimes shown relevant to user
 - Different crimes are weighted differently
- Conveys information in a meaningful and understandable way
 - Minimal clutter
 - Provides relevant statistics that complement map
 - Method for comparing areas

2. Product Description

- Discuss what a heat map is, why we are using one, what advantages that has compared to the problem we mention with traditional tools.
- Solution flow:
 - Simplify crime mapping
 - Reduce data noise
 - Visualization of crime statistics

2.1. Key Product Features

- 2.1.1. Crime Statistics
- 2.1.2. Geographical Crime References
- 2.1.3. Crime Heatmap
- 2.1.4. SafetyScore

2.2. Major Components

- 2.2.1. Crime HotSpot Website
- 2.2.2. Google Maps API
- 2.2.3. Crimes Database
- 2.2.4. Application Server

3. Identification of Case Study

- The general public
- Businesses
- Local Governments/Non-profit organizations

4. Product Prototype Description

4.1. Prototype Architecture

- 4.1.1. Crimes Database
- 4.1.2. Web Page
- 4.1.3. Application Server
- 4.1.4. Google Maps API

4.2. Prototype Features and Capabilities

- 4.2.1. Crime Categories
- 4.2.2. Location
- 4.2.3. Static Database
- 4.2.4. Crime Heatmap

4.3. Prototype Development Challenges

- 4.3.1. JavaScript MEAN Stack
- 4.3.2. Cross-browser Compatibility

5. Glossary

- 5.1. Heatmap - a representation of data in the form of a map or diagram in which data values are represented as colors.
- 5.2. SafetyScore - A number, proprietary to Crime HotSpot, that represents the relative safety of an area.
- 5.3. Crime Map - A map that has crime statistical data overlaid on it to provide information on the criminal activity of an area.
- 5.4. Javascript MEAN Stack - MEAN is a free and open-source JavaScript software stack for building dynamic web sites and web applications. The MEAN stack is MongoDB, Express.js, AngularJS (or Angular), and Node.js.
- 5.5. JavaScript Object Notation (JSON) - a lightweight data-interchange format. It is easy for humans to read and write. It is easy for machines to parse and generate. It is based on a subset of the JavaScript Programming Language
- 5.6. Application Programming Interface (API) - a set of functions and procedures allowing the creation of applications that access the features or data of an operating system, application, or other service.

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Figure 1. Screen shot of crimes for the city of Norfolk, Virginia. Reprinted from Helping You Build a Safer Community in CrimeMapping.com., 2018, Retrieved from CrimeMapping.com

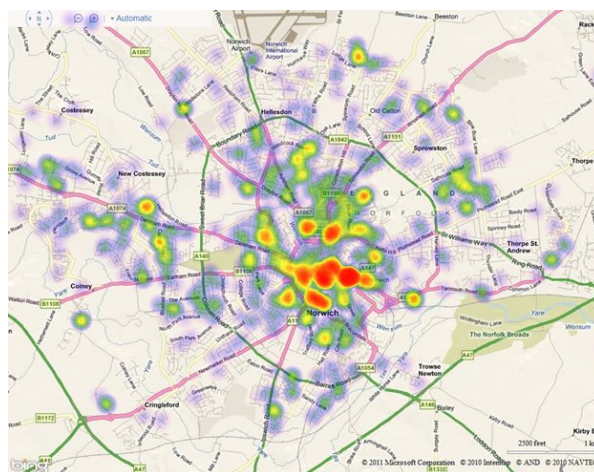


Figure 2. Example of a heatmap, with the red areas depicting a hotspot which where there is higher density of crimes. Reprinted from “Heat Map” by

Microsoft, 2011, Retrieved from
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