Live Safe and Commute Smart: Interactive Map for House Rental

Team XYZ (#143): Yuting Lu Lei Fan Mingting Lu Dun Li Chenxi Yu

Motivation/Introduction

The percentage of immigrants and students in New York City is much higher than any other cities. Searching for a safe area with acceptable commute time is the key to their survivals. However, existing house rental platforms don't provide these information. It is inconvenient and time-consuming for users to check these from somewhere else.

So we want to build an application which takes users' requirements such as commute time to their frequent destination and crime rate into account, to make better recommendations to help them find house faster and easier.

Data

1) Crime data
The crime data for New York city was downloaded from the website of NYC open data.
Characteristics:
More than six million records, each contains 35 features, 1.9GB disk size.

2) House rental data
The house rental data was scraped from the Zillow.com website.
Characteristics: More than 4,000 real-time records for New York city.

3) Map data: Google Map JavaScript API

Approaches

First, we obtained the latitude and longitude of each house record using Google API. Second, we built an interactive interface to allow the user to input frequent destination, acceptable commute time, and commute method. This was achieved primarily with HTML5, CSS3, and JavaScript. Third, we find all the houses within the current map range. The commute time was calculated for each record with the user's chosen commute method using Google API. Then, we display the house with blue dots if it is within the user's acceptable commute time, and with grey dots if it is not within the user's acceptable commute time. Libraries such as JQUERY.js and BOOTSTRAP.js were used. Last, a heat map of crime rate status is used to inform the users of the crime status in the neighbourhood.

List of innovations

- The rental recommendation system considers the crime records of surrounding areas.
- The commute time between assigned destination (searched by users) and the candidate house is used, instead of commonly used distance.
- The commute time could be measured by walking, public transportation, and driving time.

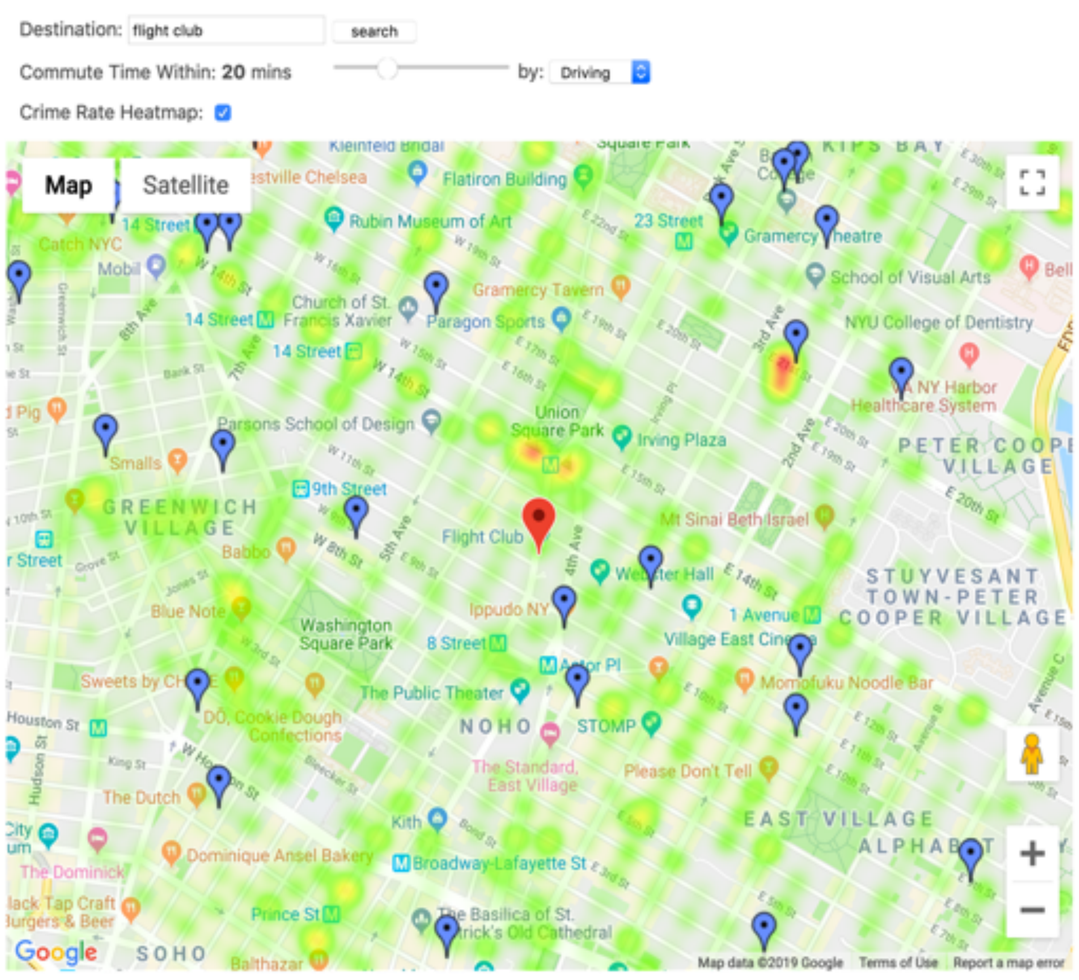

Fig. 1 The crime rate heatmap is shown with house rental information.

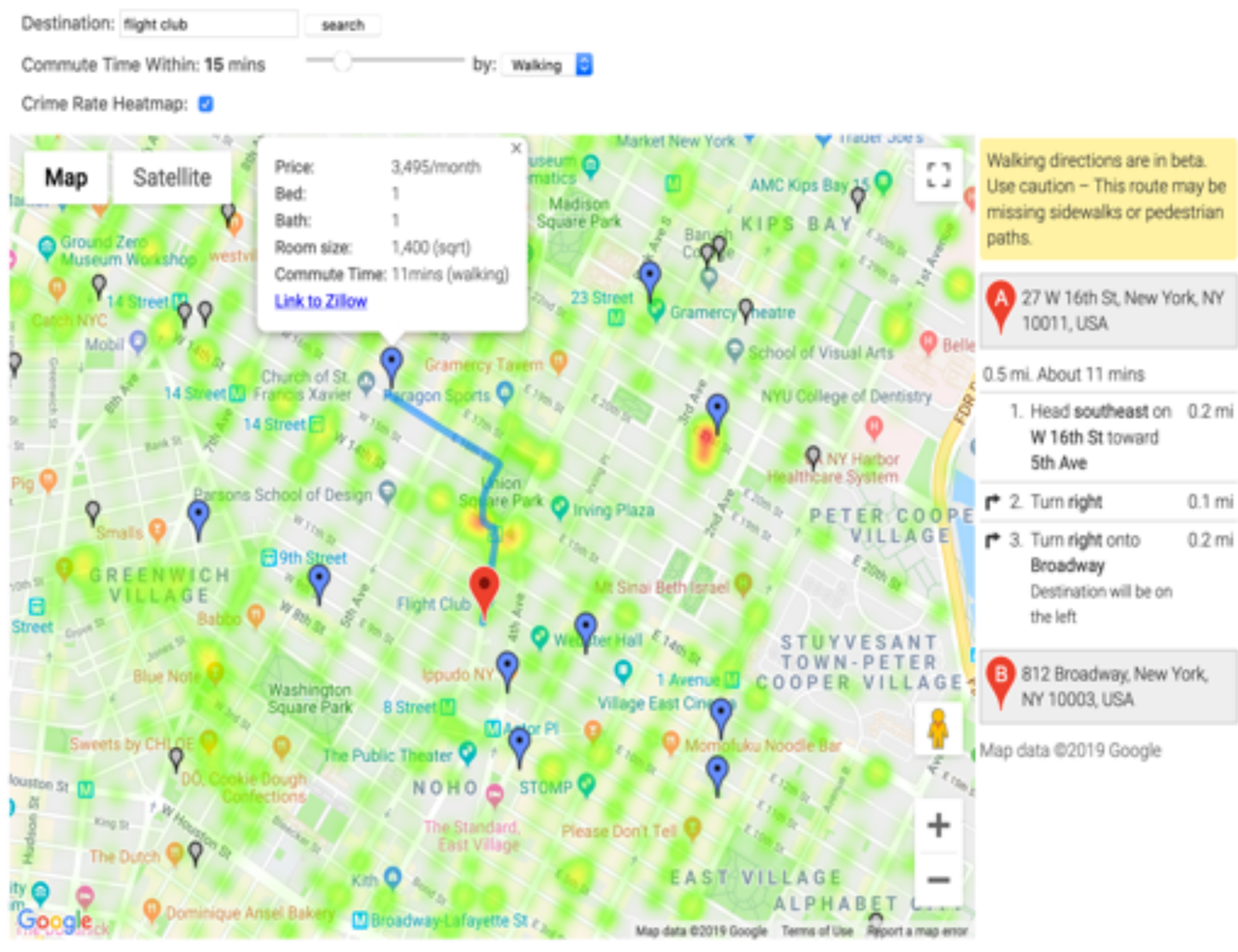

Fig. 2 Commute route is displayed on the right side when a potential house is selected.

Experiments/ Evaluation:

We carefully designed a questionnaire with Google Form and ask respondents to fill it after they explore the interface for a while. We asked the respondents to Imagine that they are going to move to New York City one month later and have no idea where to live so far. A total number of 25 respondents were collected from diversified occupation and age distribution.

According to the feedbacks, it can be shown that more than half of the users claimed that they are very satisfied with the crime rate heatmap and commute time feature of this application. The majority of the invited respondents rated our rental recommendation system over the counterparts in the market.

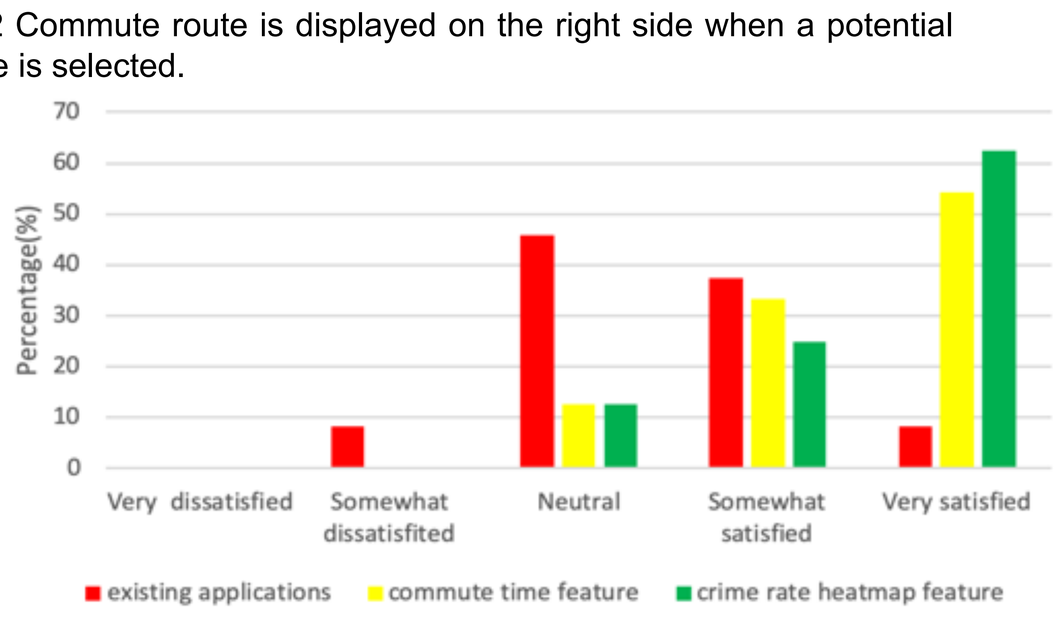

Fig. 3 User's feedbacks.

Conclusions:

An interactive application for house rental has been developed, which makes it possible for users to take commute time (from candidate house to user-defined destination) and crime rate into consideration while searching rentals on the Internet. It was deployed through Heroku and available for preview online. According to our questionnaire feedbacks, more than 87% of the users claimed that they are satisfied/very satisfied with the crime rate heatmap and commute time feature of this application. In the future, we plan to add public school and shopping center information into the interactive map.