* The Impact of Community Safety on House Ranking
* Yao, Zijun & Fu, Yanjie & Liu, Bin & Xiong, Hui.
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Problem Statement

Usually, the house values that people use to indicate the quality and benefit of the house based on the house attributes (the total square footage, number of bedrooms, bathrooms, year build, location etc.). However, from buyers’ and investors’ perspective, there are more factor need to be considered for making investment decision. One of the factor that often in consideration it the community safety degree of place where the house locates. Therefore, there is a demand of a tool to compare the house values which taking community safety degrees into account.

Dataset Description

All the data of houses and crimes are collected from Denver Open Data Catalog. For the house dataset, authors decided to only choose single family detached home which is the major type in US. They selected 3000 houses evenly spread in a major residential region of north Denver which include North Park Hill, South Park Hill, Hale, Montclair and Hilltop. All the appraised valued was in 2015. For crime data, the authors collected the residential forcible burglaries happed in Denver in five years before the appraisal implemented (2009-2014). For the house profiles, it was the neighborhood data from demographic data of 2010 and 2000 the US census.

Denver open data catalog. [Online]. Available: http://data.denvergov.org/

Literature Review

This paper focuses on solving two research challenges relate to analyzing the impact of community safety degree on house value ranking. Challenge 1: what crime analysis can be done to generate an in-depth understanding of community safety. In other words, how can we assess the community safety degrees of an area by analyzing historical crime data? Challenge 2: How to systematically model the impacts of community safety on house values without the effects of other aspects, such as neighborhood income level and rating of a nearby school. This means building a model which can separately evaluate the impact of community safety degree on house value.

The authors presented a systematically study on house ranking. For the first challenge, they came up with the extract of community crimes evidence in crime severity and crime temporal correlation. To recognize which crime account to which house they calculated the distance between the house and the location where the crime committed. The crime will be counted to a house if it happens within a specific range from the house. To build the model, the author adopted RankLib as baseline algorithm implementation.

References

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Measuring the impact of crime on house prices

Thaler 1978 was the first to estimate the cost of crime with an implicit price model using data from Rochester NY, finding that the average property crime lowered house prices by approximately $1930 in 1995 prices. Study by Hellman and Naroff 1979 and Rizzo 1979 used census tract data from Boston and Chicago respectively and confirmed that crime had significant impact on house prices.

Cohen 1990 argues that it is necessary to use the cost of specific crimes rather than index crime data to estimate a willingness to pay for reduced crime with deonic models.

The cost of rime

Offences reported to the police divided by the population is the customary measure of crime that is used to compare public safety across jurisdiction and within jurisdictions over time. When the distribution of these cries differs among communities, this simple sum of reported crimes will not offer an accurate assessment of differences in public safety between places or time periods.

Where there are more serious crimes in the distribution of a fiven number of offences, the number of crimes stay the same but the severity of crime rises and arguably public safety has declined

It would be desirable to have a system of weights to measure the relative severity of crimes which could be used to compare different distribution of offences