Housing Affordability In The Twin-Cities Metropolitan Area

Trends in U.S. cities towards a high concentration of goods, jobs and services to urban areas has made these spaces more attractive for living, causing a strain on the housing supply in parts of some major urban areas. These areas have witnessed a decrease in affordability of, and higher demand for housing. In Predicting gentrification using longitudinal census data, Steif speaks on trends toward a decrease in affordability in areas surrounding city centers saying, "Typically, urban residents trade off proximity to amenities with their willingness to pay for housing … gentrifiers will choose to live in an adjacent neighborhood within a reasonable distance of an amenity center with lower housing costs" A common consequence of this trend, in which urban residents decide to "trade off proximity to amenities with their willingness to pay" is rapid neighborhood change, where a large influx of newcomers relocate to cheaper areas in the urban center looking to be closer to city services, and consequently, begin to drive up housing costs in these areas. A decrease in affordability eventually prices former residents out. This is one of the effects of a complex, multi-faceted process known as gentrification.

A potential client for this project is the Metropolitan Council, a body involved in planning, policy, and the provision of services for the Twin-Cities metropolitan area in Minnesota. The Metropolitan Council states as a main priority of its agenda improving housing opportunities in the region. As such, it has created several comprehensive plans and agendas to address present and future issues in housing. Some of these plans attempt to meet demands of affordable housing in communities throughout the metro area through projects created using forecasted models. Others are focused on shaping the livability of communities, with the understanding that good housing policy not only meets the needs of a community to house its population, but also factors in the proximity of housing to good transportation, city services, employment and schools. By investigating spatiotemporal trends in housing affordability, this project is intended to supplement these plans and ensure that while these projects are carried out, short-term demand for affordable housing continues to be met.

Currently, the Metropolitan Council Housing and Redevelopment Authority administers the largest Housing Choice Voucher program in the state of Minnesota, serving over 6,500 households. Funds from this program have the capacity to help residents navigate rising rent costs in the short-term, as they can be allocated to subsidize the rent of a resident through entering into a contract with the property owner. However, in order to benefit from this program, a resident must meet certain criteria for eligibility, and a rental property must fall in a PHA jurisdiction. However, voucher programs may not be enough to mitigate the effects of quickly changing neighborhoods.

This project proposes to examine spatiotemporal trends in rent costs in all Twin-Cities communities who participate in the HRA. Ideally, this project will be able to show the Metropolitan Council where and when affordability conditions fluctuate, such that they can equip themselves to respond more effectively and efficiently to real-time affordability issues in housing in urban centers, and intervene, where necessary, in fastly changing communities where residents are being displaced.

An approach to solving this problem will first involve obtaining data on rent costs in local communities. The characteristics of rental data relevant to this project include the size of units

(studio, two-bedroom, three-bedroom, etc.), square footage, price, location (access to services and transportation), availability of voucher funds in accordance with PHA jurisdictions where units are located, established fair market rents where units are located, and availability of and demand for other affordable housing where units are located.

Data for this project will include rental listings on sites such as Craigslist or AirBnB. It has not yet been determined whether this data will be obtained using a web-scraper or an API. Other spatial data such as PHA jurisdictions and fair market rent boundaries will be obtained through the Public Housing Authority and the Department of Housing and Urban Development.

Solving the problem will also involve selecting features from the data for developing machine learning models. This will first involve a basic analysis of features that stand out in the data. A machine learning technique will be selected based on its suitability in predicting housing prices and their corresponding locations using these features.

The final deliverables of this project will include repository with the code, a paper describing the problem, methods, and outcome of the project. For visualization purposes, a slide deck will be created, as well as an interactive map containing relevant layers.