Using Computer Algorithms to Recommend Development that Reduces Racial Inequality

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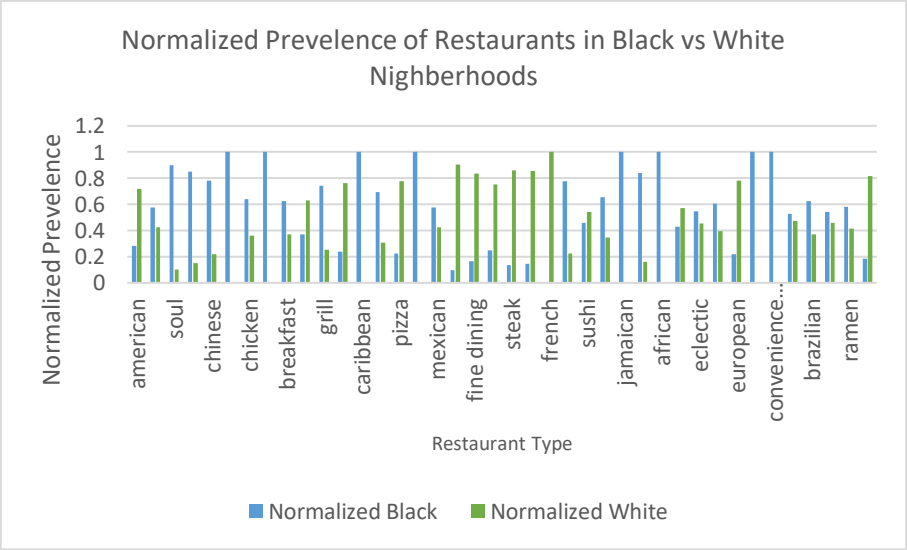
The relationship between humans and the structures they live in have significant ramifications for the organization of those individuals and their lifestyles. Structures had casual relationships with the character of the neighborhoods and thus the character of the people in those spaces. This summer I developed and familiarized myself the many dimensions of racial inequality in cities, how it manifests, choose Atlanta, Georgia as a case study, and investigated the presence of inequality in Atlanta. Choosing a single city was essential for reducing the problem size and allowing for adequate data collection. Atlanta was chosen for its size, racial makeup and distribution, wealth variation within these racial groups, and its significance as an American city.

Before applying algorithms to identify racial inequality created from structural layout, I reviewed the existing Sociological literature on racial inequality in cities. In this research it became clear that the level and complexity of analysis was dependent on the type of data available for the given community. Spatial data was the most accessible, so inequality in access to essential amenities was determinable using only spacial data making for a clear way to start understanding inequality in Atlanta. Spacial data was combined with demographic data of the given area to allow for multivariate analysis. Analysis was conducted on the relationships between racial makeup and accesses to grocery stores, restaurants, parks, and medical clinics. For grocery stores, there was a negative correlation between the percent African American makeup of a neighborhood and the quality of accessible stores (Liner $R^2 = .65$, Log $R^2 = .73$). This is a broad relationship between location and access quality, and future work will identify exact locations of poor access.

This answers only half the initial problem: where is the inequality and what form does that inequality take. The second question is to figure out what infrastructure is most suitable to offset this inequality. To answer this looking into what types of development exist within areas with similar demographic makeups. When choosing what grocery store to place in an area with poor access, other areas with similar demographic makeups to the one with poor accesses can provide an idea of what specific grocery stores will be utilized given the community it will be implemented in. Amenities cssuitable for a given neighborhood are selected based on what amenities exist in similar neighborhoods. This is done through spatial analysis and creating relationships between the makeups of neighborhoods and their corresponding amenity types. Figure 1 shows the prevalence of different types of restaurants in black and white neighborhoods, which could act as a guide for what development is more suited for either neighborhood type. Selecting suitable options prevents the onset of development that could lead to gentrification.

Figure 1



The two methods above: finding places of access inequality, and selecting the correct infrastructure type to alleviate the respective inequality will be implemented into an optimization algorithm to determine development recommendations to reduce racial inequality.

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