Exploring Perceptions of Structural Racism in Housing Valuation Through 3D Visualizations

Lisa Haye[1], Courtney Cogburn[2], Oyewole Oyekoya[3]

[1]Department of Economics, John Jay College of Criminal Justice, CUNY
[2] Associate Professor, School of Social Work, Columbia University
[3] Associate Professor, Department of Computer Science, Hunter College, CUNY

Introduction

- Conversations regarding structural racism has increasingly become a contentious, even politicized topic

- **Callaghan et. al (2021)*** notes utilizing data increased acknowledgement from white Americans of their structural advantages

- The REU's structural racism project attempts to **blend data with narrative storytelling to highlight the consequences of structural racism**

Bennett Callaghan, Leilah Harouni, Cydney H Dupree, Michael W Kraus, and Jennifer A Richeson. 2021. Testing the efficacy of three informational interventions for reducing misperceptions of the Black–White wealth gap. *Proceedings of the National Academy of Sciences* 118, 38 (2021), e2108875118.

Related Work

- Visualization of structural racism usually relegated to 2D formats, **dearth in 3D formats**

- XR instances of structural racism visualization include:

- Professor Cogburn: *1000 Cut Journey*

- 2022 REU predecessor: "Visualizing Structural Racism Data in Augmented Reality"
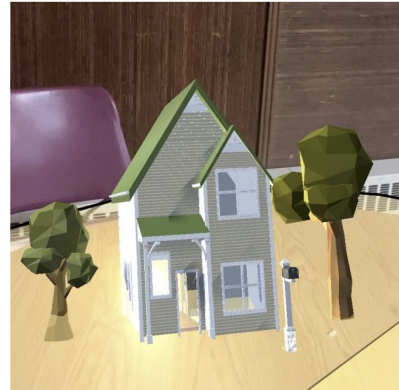
Methodology

Mapbox and Unity used to create maps of

Riverdale and Soundview, and different

models of these neighborhoods were

made based on different visualization

dimensions. Project focused on condos

(n=77),redlining legacy, and race.
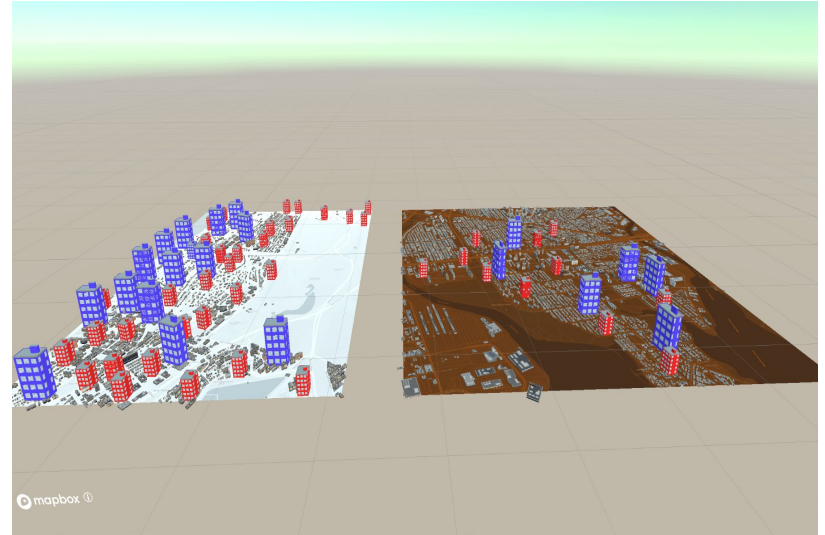
M10: map layout, size, condo color by median Bronx price

User Study

- Survey data collected on Google Forms

- Users evaluated 17 models and were asked two questions to gauge their perceptions

- Asked to rank models from best to worst in terms of preference for visualizing structural racism in housing valuation

Model 1: This model below represents Riverdale and Soundview, where the map layouts are colored based on the predominant racial demographic of either community, and the quantity of condominiums on each map represents the number of condos currently listed for sale in the respective neighborhoods, according to Zillow.

On a scale of 1 to 5, how well does the model represent the description above accurately?
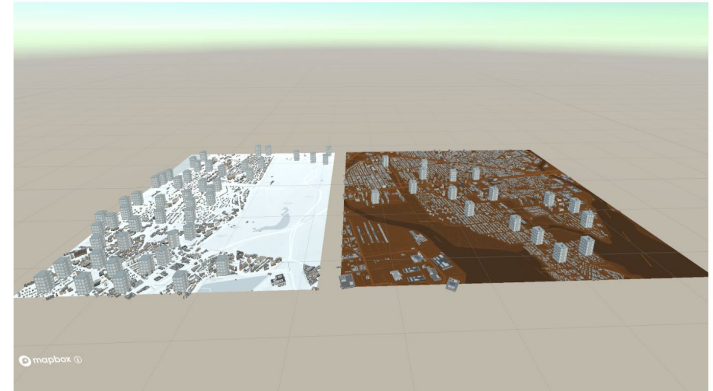
	1	2	3	4	5	
Poor	○	○	○	○	○	Excellent

An example of a question asked on the user study

Preliminary Observations and Results

- Non-parametric Friedman test conducted on SPSS of 23 observations

- Responses are currently at 26 observations

- M17 was ranked first most frequently, with 14 votes

- Feedback and comments:

- Problems experienced with ranking question

- Consider modifying models' descriptions

- Sophisticate images

- Interesting critique; great for discussions in paper

Limitations and Future Work

Limitations:

- Limited study due to data constraints; **not generalizable**
- Failed to visualize factors such as climate and green space in a 3D format, forced to pivot solely towards housing valuation
- Small sample size

Future work:

- Include other factors in models (climate, greenspace, education, health, etc.)
- Immersive application (XR)
- Create a map that expands to the municipal, city, or even federal level
- Wider sample size to glean more information on visualization preferences

Thank you for listening!

Any questions?