The Street Score project: Scope for Improvement?

Knowledge Lab Team Presentation

Nandana Sengupta

June 29, 2016

The Street Score project: Scope for Improvement?
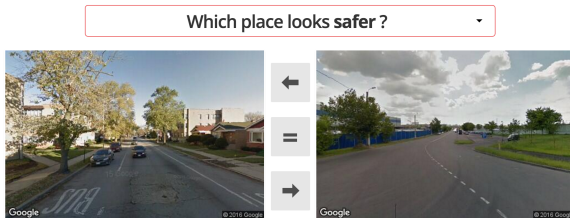
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The Street Score Project

- ▶ MIT Media Lab Project
- ▶ Generating database of visual perceptions of safety/uniqueness etc

Which place looks **safer** ?

- ▶
- ▶ Participants shown **random** pairs of images
- ▶ Main application: ranking of neighborhoods/ cities.
- ▶ Cities in dataset: Boston, NYC, Linz, Salzburg
- ▶ Number of images: 4109 , Number of participants: 7872 , Number of comparisons: 208738.

Limitations

- Google Street View – represents the way cities look from a car
- Early mornings – less traffic, people, shops closed
- Not taking advantage of similarity in images or participants
- Sparsity of win-loss matrix, multiple images at the same location
- Prediction accuracy
- We focused on a single city Boston
    - 1237 images from 635 unique locations
    - Less sparse than overall matrix but still not enough observations for consistent ranking
    - Multiple images at the exact location

Feature Extraction

- **Visual Feature Extraction**
  - MIT's Places CNN (Convolution Neural Networks)
  - Deep Learning Software, open source
  - Scene Recognition: 205 scene categories eg, residential, highway, apartments etc.
  - User Input: Raw Image
- **Demographic Feature Extraction**
  - US Census Data and American Community Survey Database
  - Demographic characteristics by region, eg, average income, educational levels, racial distribution etc
  - User Input: Latitude and Longitude

# Feature Extraction using Deep Learning Software

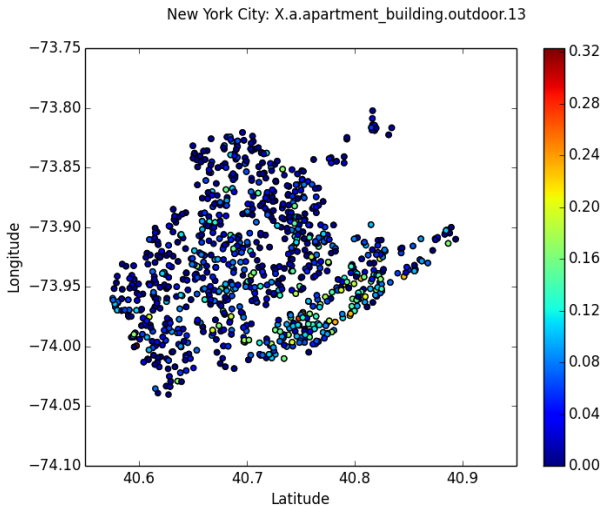**Top 3 Predictors:** (office building, apartment building, hospital)

Top 3 Predictors: (yard, residential neighborhood, driveway)

Feature Extraction: distribution across physical area

Boston: X.r.residential_neighborhood.151

Feature Extraction: distribution across physical area

New York City: X.a.apartment_building.outdoor.13
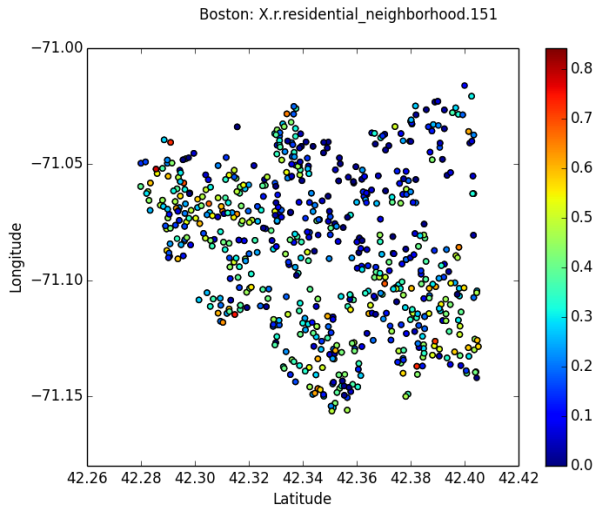
Clustering?

- Divided Boston images into 100 clusters (k-means clustering)
- Features for each cluster: weighted average of member images