

Neighbourhood recommender system

or The Battle of the Neighbourhoods

Introduction

- Relocation to a new city can be stressful and time consuming
- Real estate resources help, but don't provide with liveability information and amenities in the area
- It would be nice to have neighbourhood recommendation based on our interests and day-day-to-day activities

Data - Neighbourhoods

- Neighbourhood information for 102 postal codes
 - https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_
- Geolocation data (“pgeocode” python package)

	Postal Code	Borough	Neighbourhood	Latitude	Longitude
0	M3A	North York	Parkwoods	43.7545	-79.33
1	M4A	North York	Victoria Village	43.7276	-79.3148
2	M5A	Downtown Toronto	Regent Park, Harbourfront	43.6555	-79.3626
3	M6A	North York	Lawrence Manor, Lawrence Heights	43.7223	-79.4504
4	M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government	43.6641	-79.3889

Data - Foursquare API

- List of 470 Points of Interest (POI)
- About 50000 Foursquare API requests for POIs
 - <https://developer.foursquare.com/docs/places-api/endpoints/>

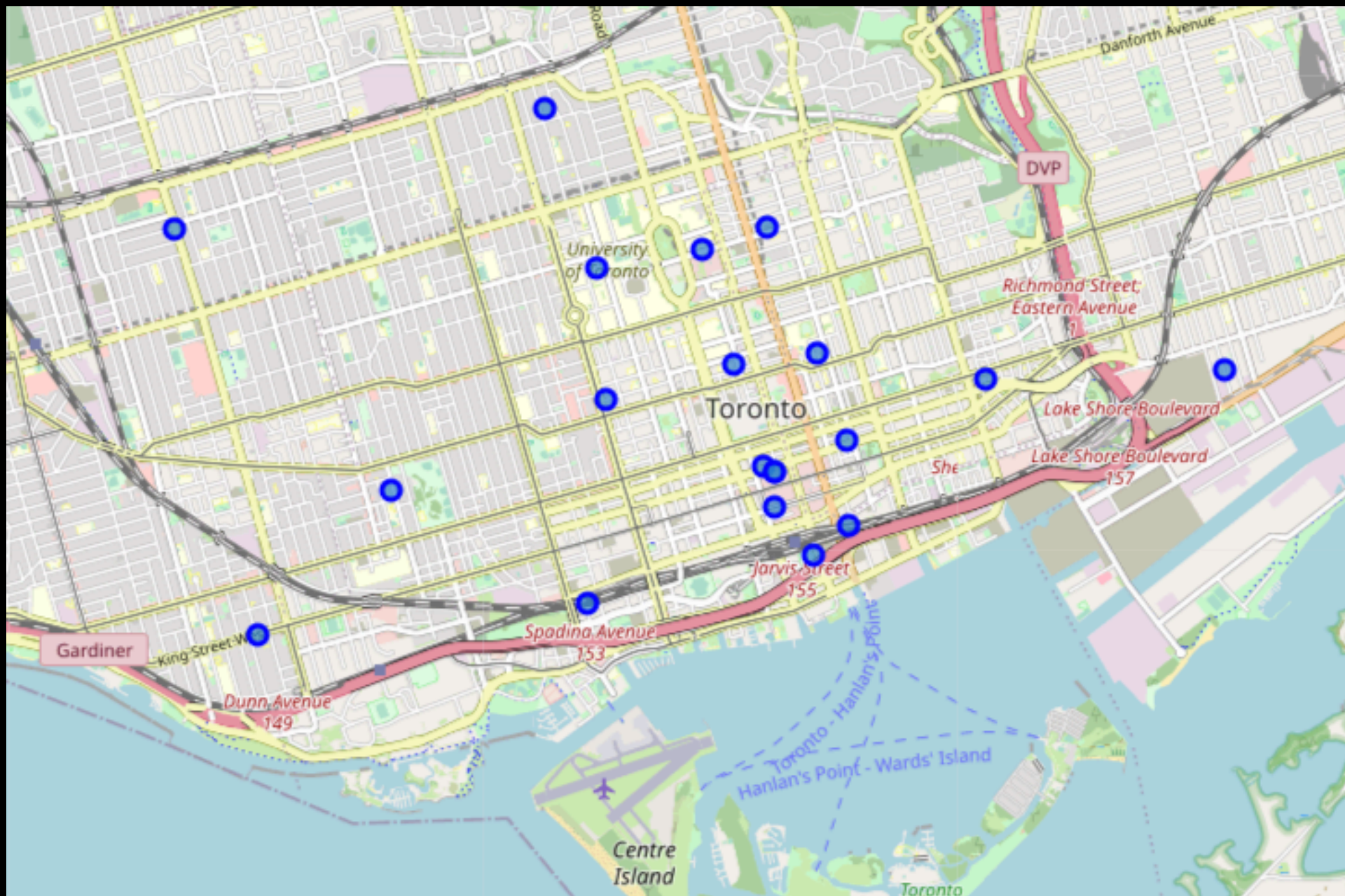
	Postal Code	Borough	Neighbourhood	Latitude	Longitude	Amphitheater	Aquarium	Arcade	Art Gallery	Bowling Alley	...	Road	Taxi Stand	Taxi	Tourist Information Center
0	M3A	North York	Parkwoods	43.7545	-79.33	0	0	0	0	0	...	0	0	0	0
1	M4A	North York	Victoria Village	43.7276	-79.3148	0	0	0	1	0	...	0	0	0	0
2	M5A	Downtown Toronto	Regent Park, Harbourfront	43.6555	-79.3626	0	0	4	47	1	...	0	0	0	2
3	M6A	North York	Lawrence Manor, Lawrence Heights	43.7223	-79.4504	0	0	2	1	1	...	0	0	0	0
4	M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government	43.6641	-79.3889	1	1	3	45	1	...	0	0	1	0

Analysis

- Data Normalised with min-max method
- Visualisation performed by Folium library
- Multiple different POI testing sets used
- Content based filtering methodology applied

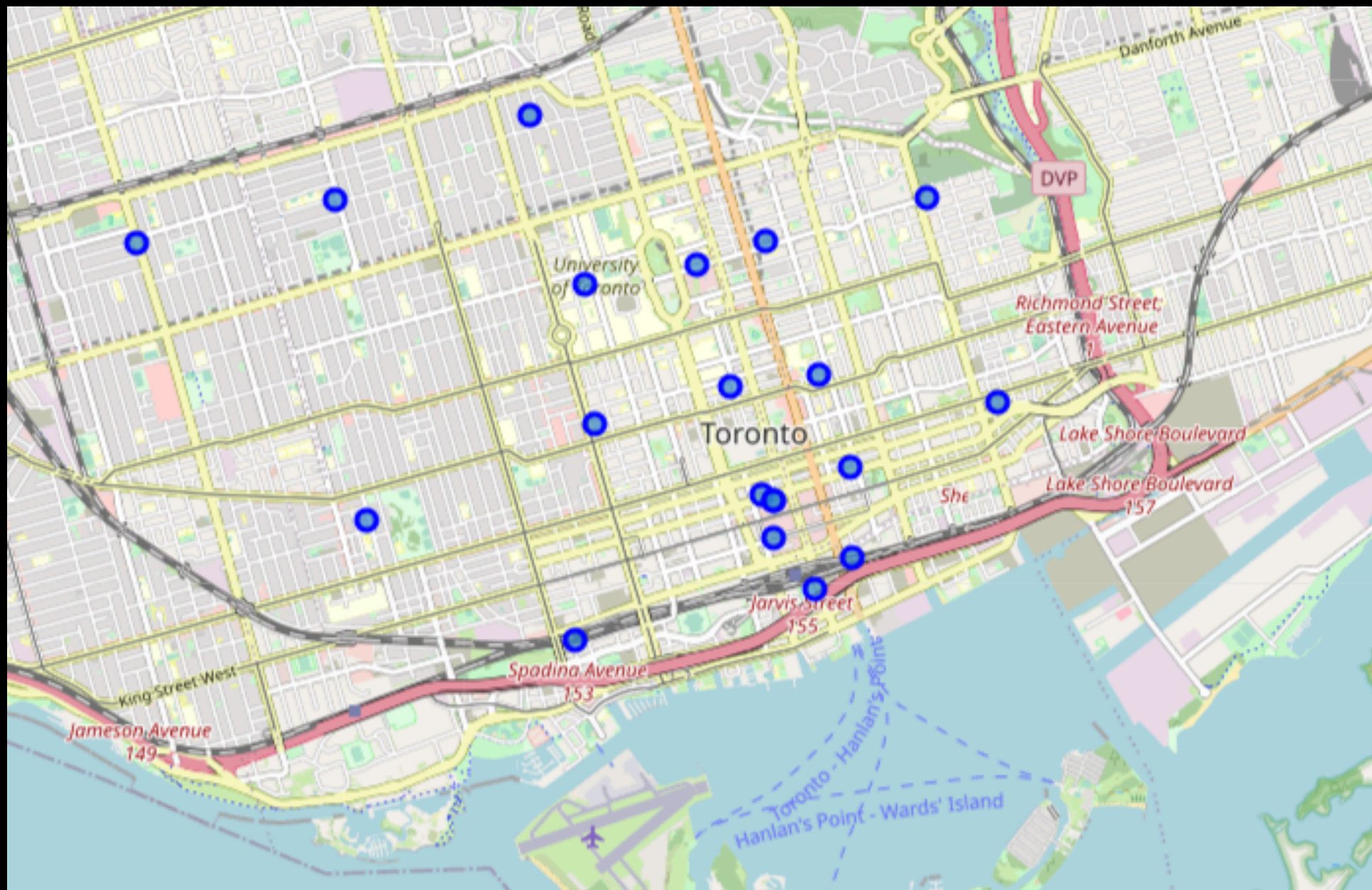
Results - 1

- Random POI sample selection



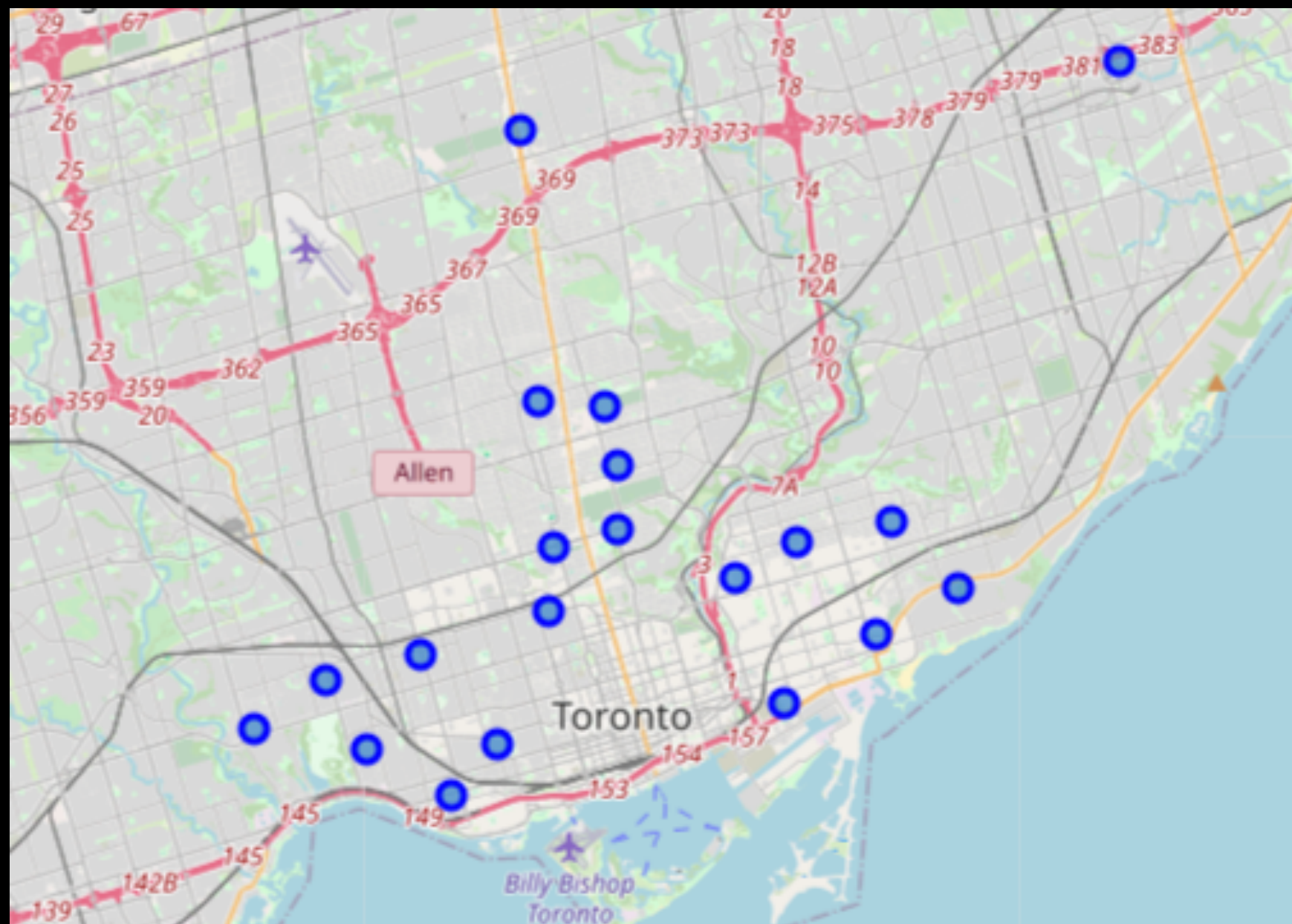
Results - 2

- User hand picked POI list



Results - 3

- User POI list with Toronto Downtown excluded



Conclusion

- The system is good at recommending based user defined list of POIs
- Alternative to Foursquare POI data sources need evaluation
- Other algorithms and methodologies can complement the system to improve accuracy

Thank you!