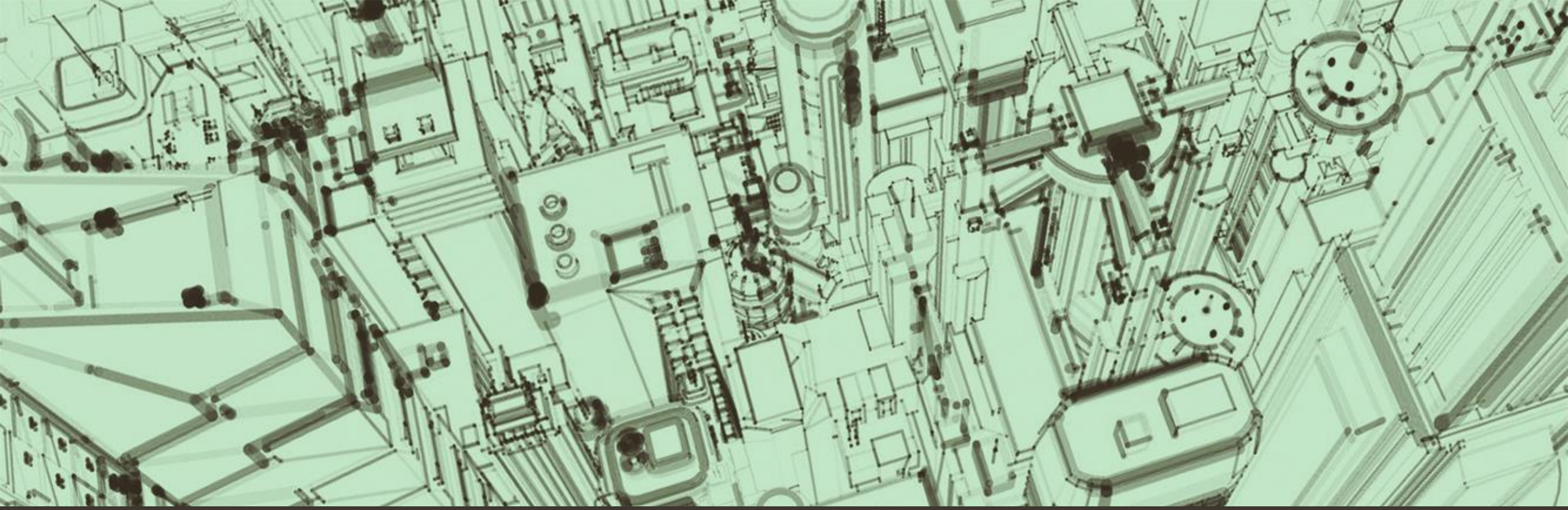


The Battle of the Neighborhoods

Shannon Wang

Business Problem

- In this project we will try to find an optimal location for a restaurant. Specifically, this report will be targeted to stakeholders interested in **opening an Italian restaurant in Taipei, Taiwan**.
- Since there are lots of restaurants in Taipei we will try to detect **locations that are not already crowded with restaurants**. We are also particularly interested in **areas with no Italian restaurants in vicinity**. We would also prefer locations **as close to city center as possible**, assuming that first two conditions are met.
- We will use our data science powers to generate a few most promissing neighborhoods based on this criteria. Advantages of each area will then be clearly expressed so that best possible final location can be chosen by stakeholders.

Data Requirement

- Based on definition of our problem, factors that will influence our decission are:
- * number of existing restaurants in the neighborhood (any type of restaurant)
- * number of and distance to Italian restaurants in the neighborhood, if any
- * distance of neighborhood from city center

- We decided to use regularly spaced grid of locations, centered around city center, to define our neighborhoods.

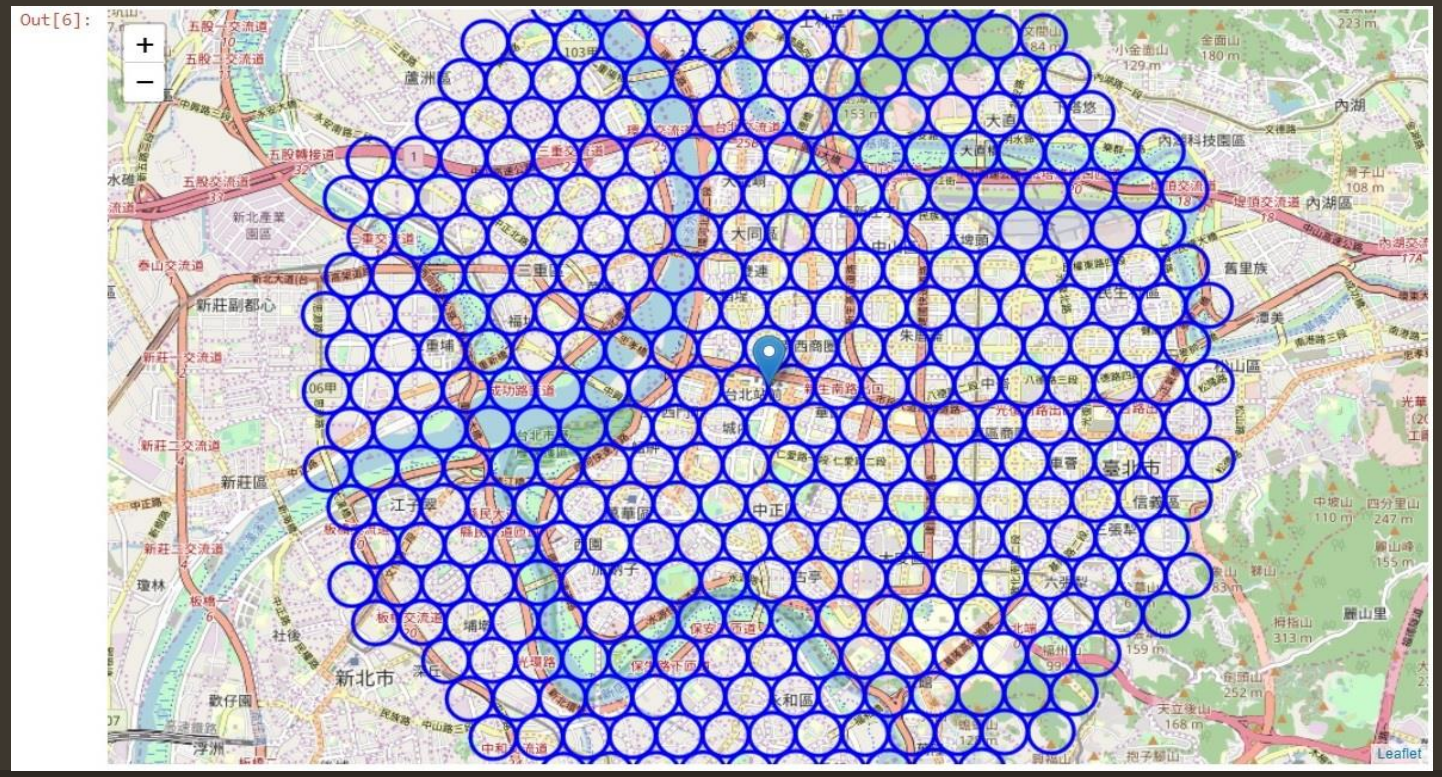
Data Requirement (Cont'd)

Following data sources will be needed to extract/generate the required information:

- The centers of candidate areas will be generated algorithmically and approximate addresses of centers of those areas will be obtained using Google Maps API reverse geocoding.
- The number of restaurants and their type and location in every neighborhood will be obtained using Foursquare API.
- The coordinate of Taipei center will be obtained using Google Maps API geocoding of well known Taipei location (Taipei Main Station).

Neighborhood Candidates

- Based on the Coordinate of Taipei Main Station, Taipei, Taiwan: [25.0471778, 121.5172047]
- 364 candidate neighborhood centers are generated.

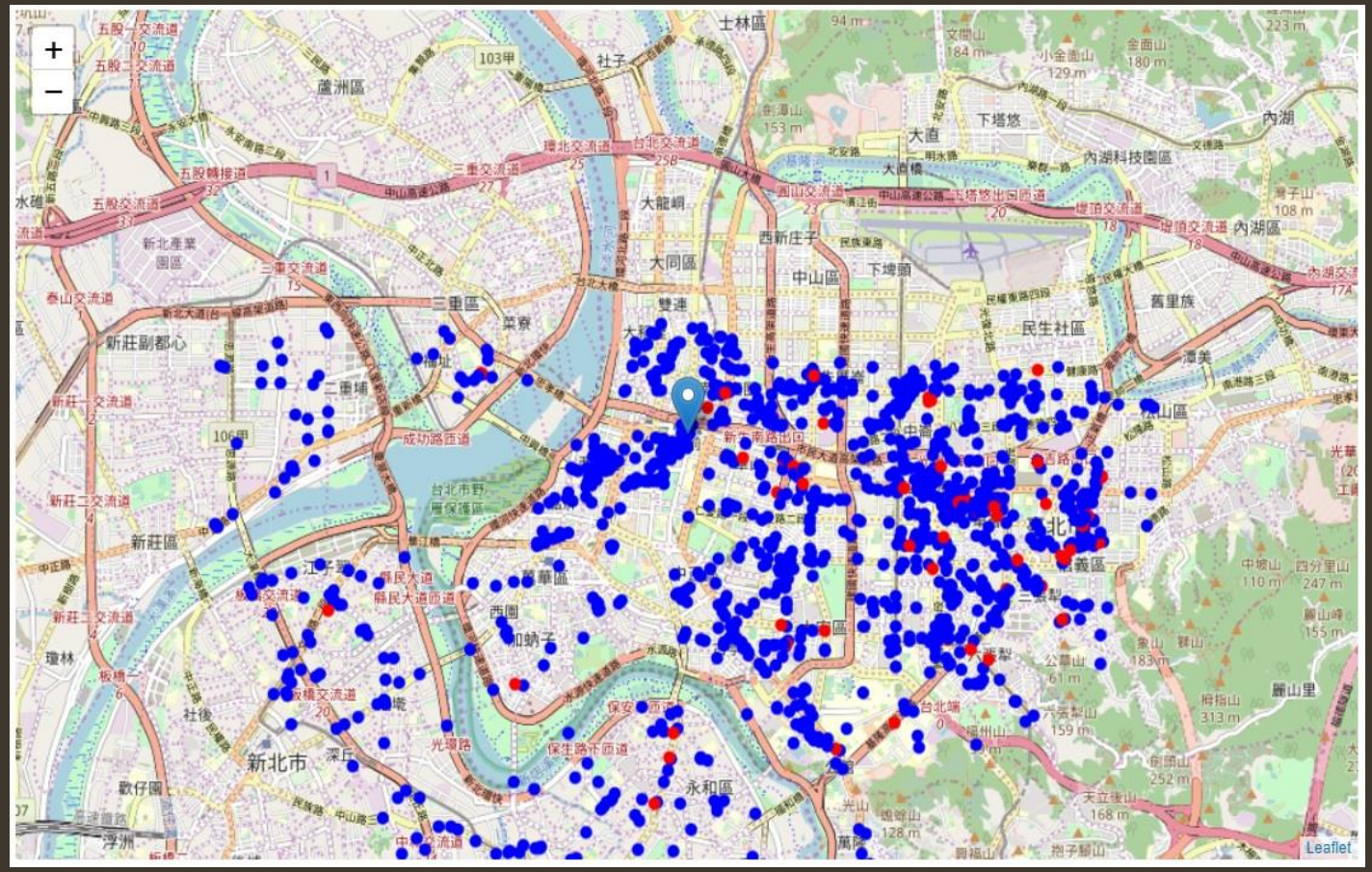


Foursquare API

Leveraging Foursquare API, we got the venue information around the area and extracted the restaurants we need as below:

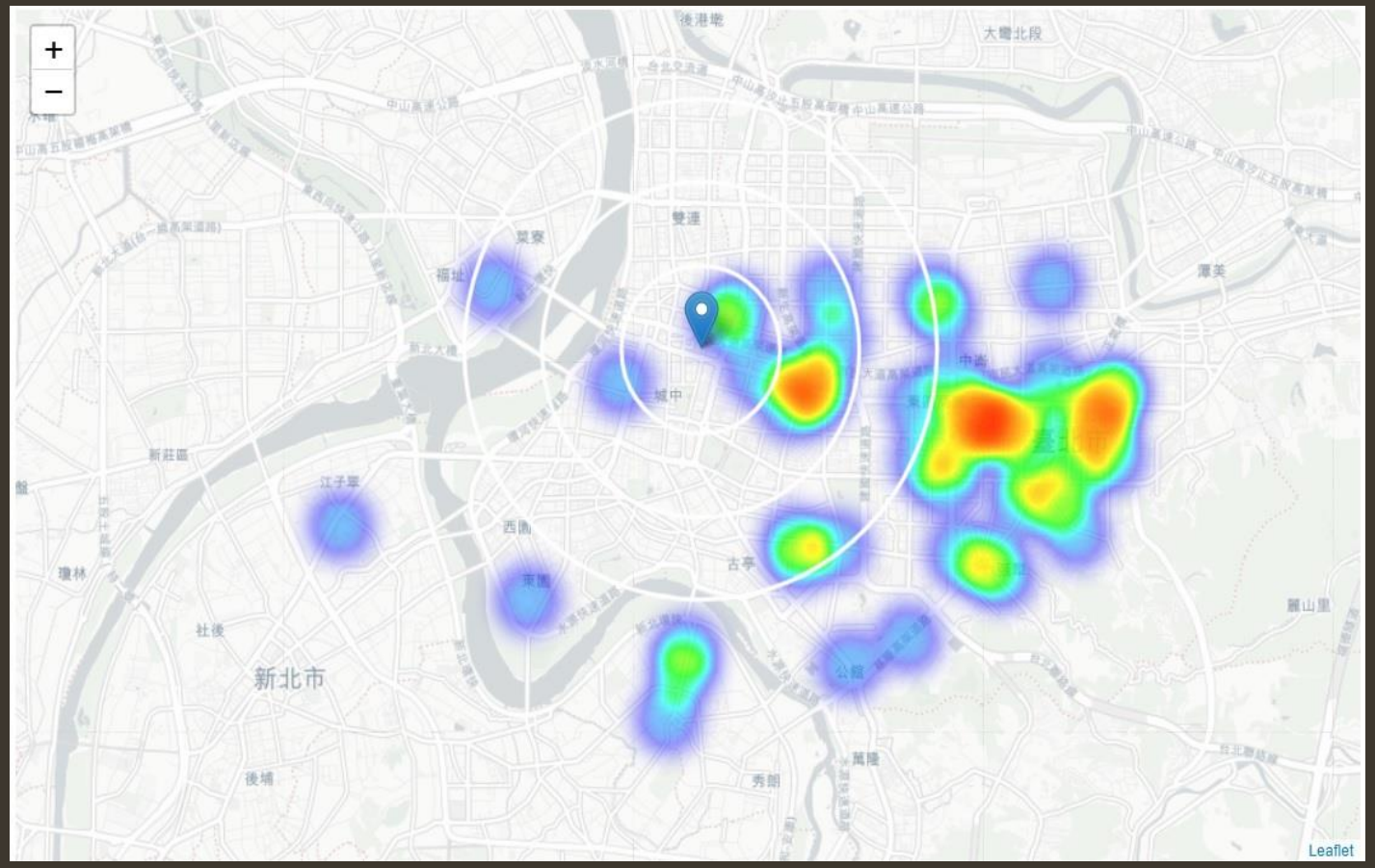
- Total number of restaurants: 1262
- Total number of Italian restaurants: 61
- Percentage of Italian restaurants: 4.83%
- Average number of restaurants in neighborhood: 2.961538461538461 7

The locations of the restaurants and Italian restaurants



The hot map of the restaurants

The hot map of the Italian restaurants



Focus on the Eastern District of Taipei

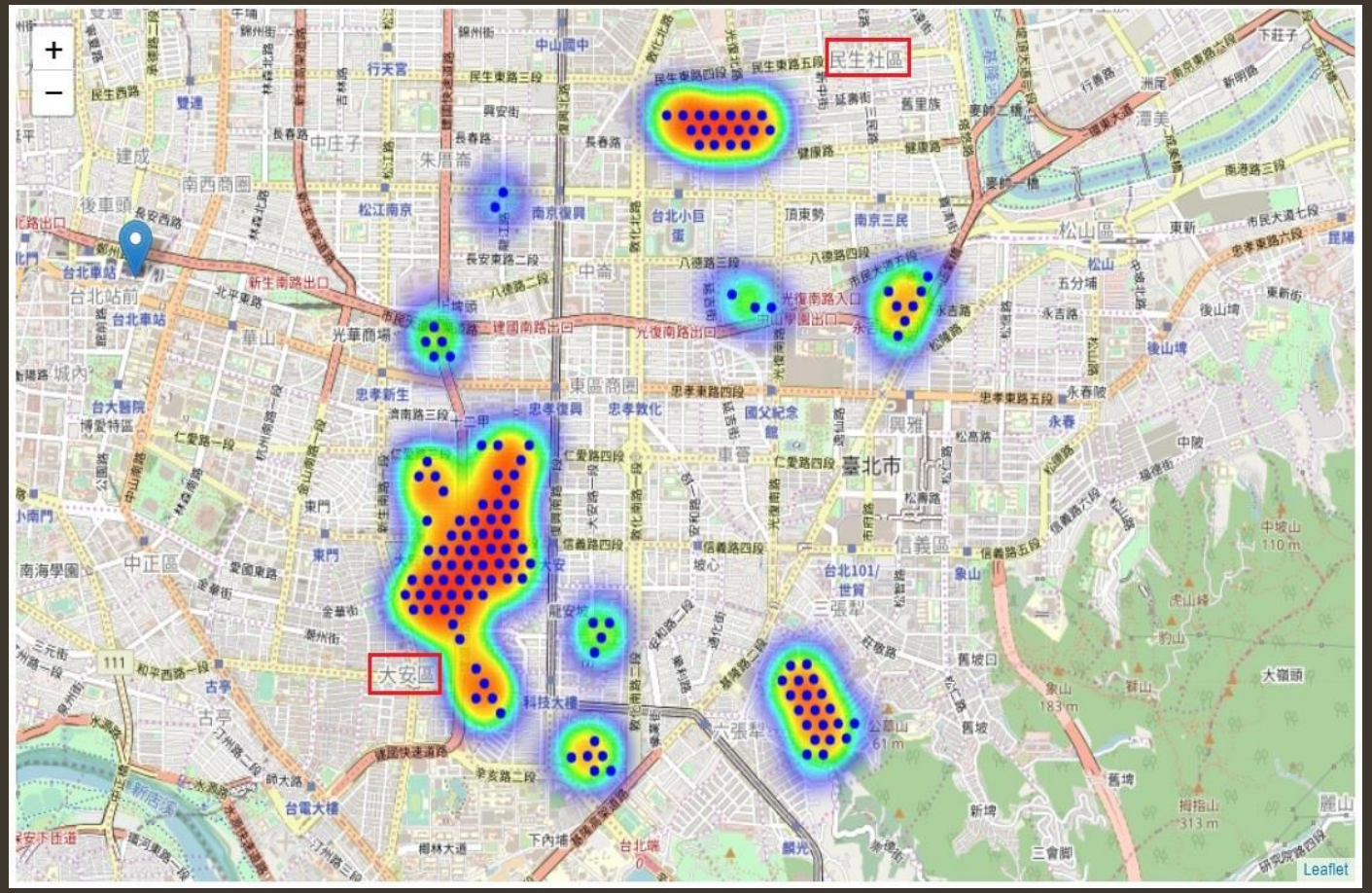
The Location Candidates - Information

The locations with no more than two restaurants in radius of 250 meters, and no Italian restaurants in radius of 400 meters.

- Locations with no more than two restaurants nearby: 211
- Locations with no Italian restaurants within 400m: 519
- Locations with both conditions met: 127

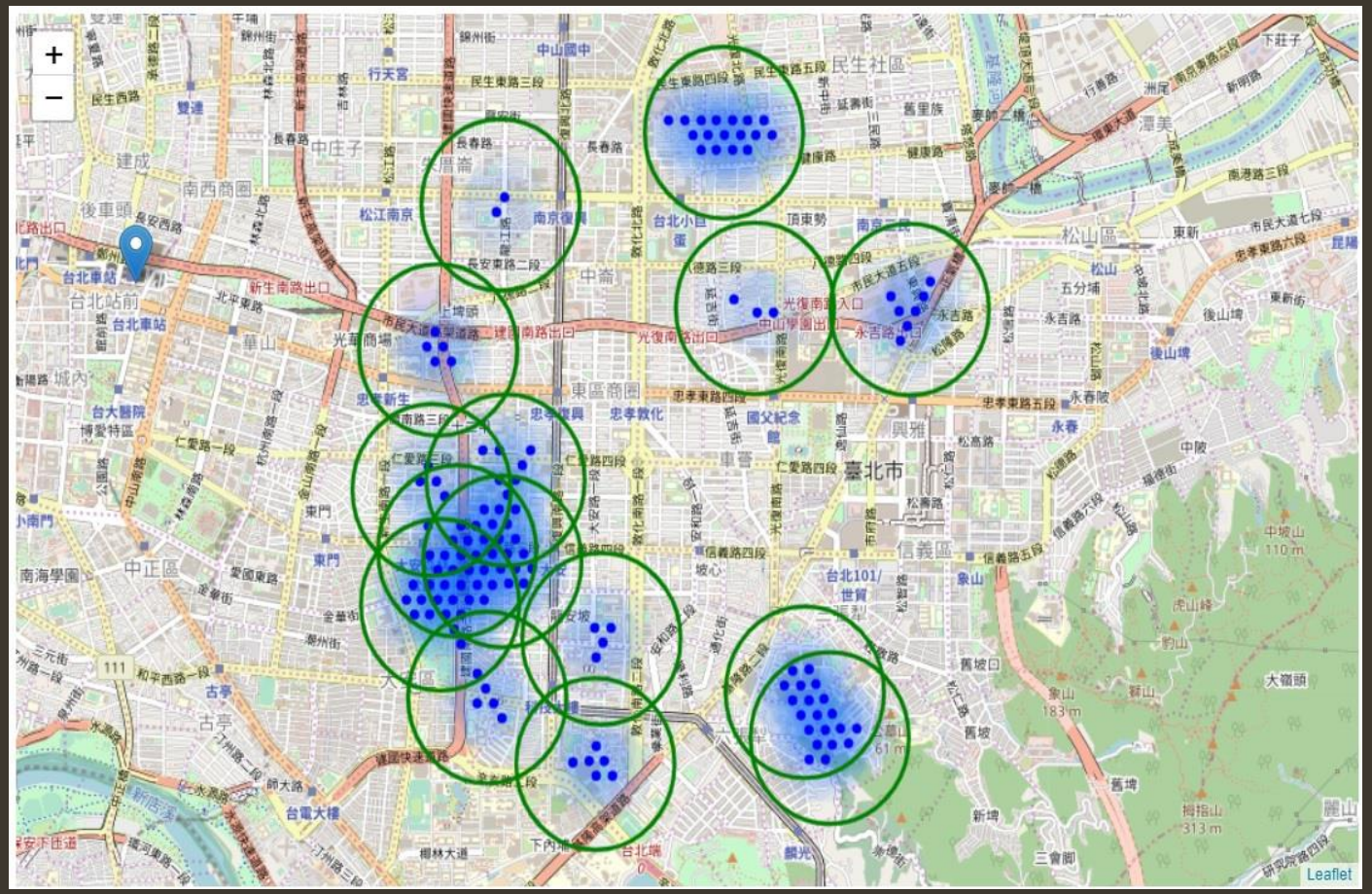
The Location Candidates – Point Map

The Candidate Locations – Hot Map

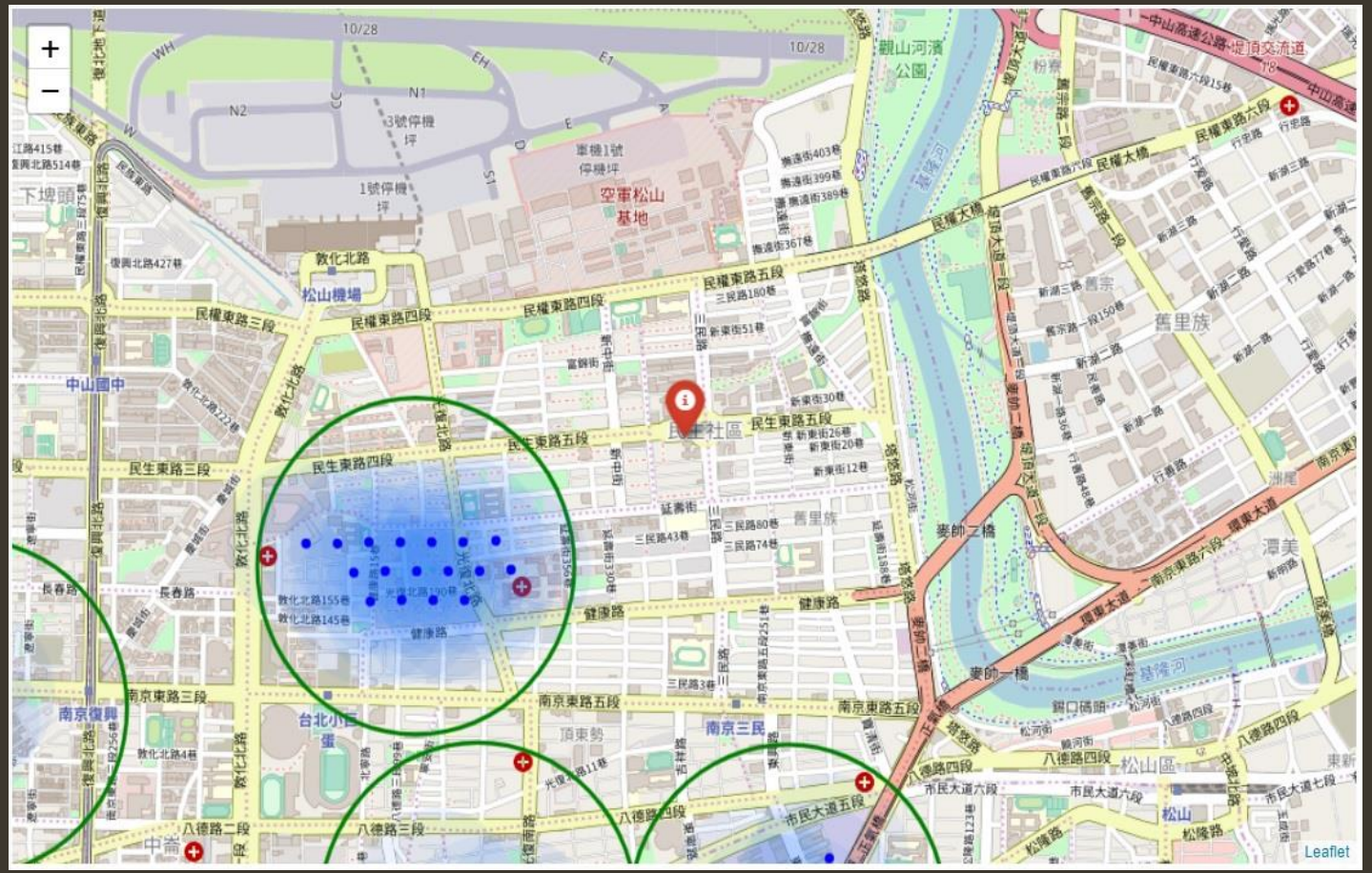


The Location Candidates – Clustering

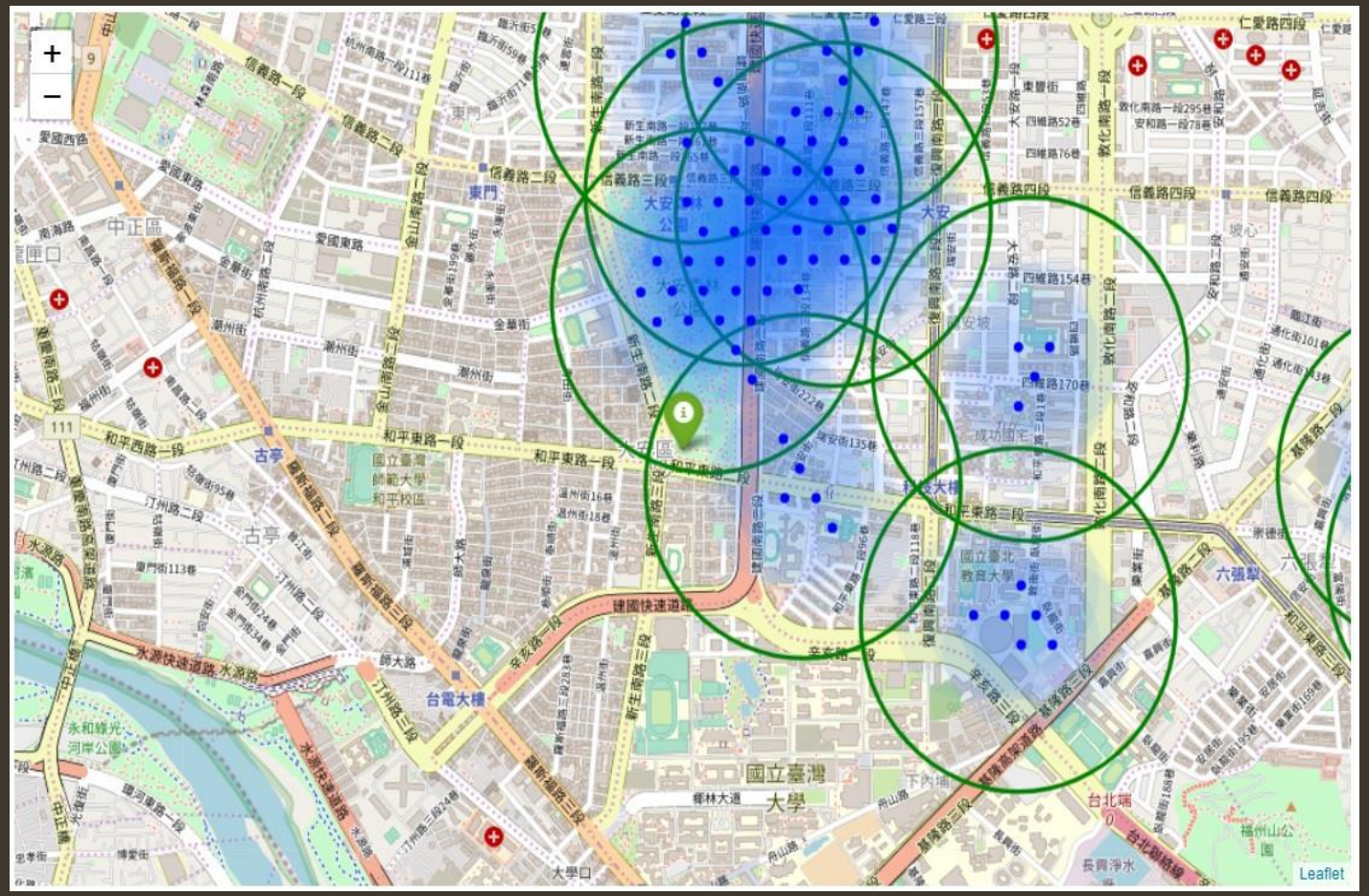
The Location Candidates – Clustering without hot map



The Location Candidates – Zoom in near Minsheng Community (Chinese:民生社區)



The Location Candidates – Zoom in near Daan District (Chinese:大安區)



Conclusion - The 15 Location Candidates for Stakeholders