CLUSTERING TECHNOLOGY HUBS AROUND THE WORLD

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INTRODUCTION

Background

- Technology is one of the fastest growing industries
- Start-ups are popping up almost every day
- Many unknown technology hubs around the world that are making waves in the industry
- Investors are looking for untapped talent
- Entrepreneurs are looking for emerging markets

Problem

- To find the up and coming technology hubs to help not only entrepreneurs but also investors.

- Bring capital and talent together

Data Sources

- In order to find the most popular technology hubs around the world data was extracted from multiple sources:
    - Wikipedia Technology Hubs Worldwide for the Latitude and Longitude of each hub (City/General Location)
    - Startup Genome for cities with high start-up rates divided into sectors
    - Bloomberg for countries with a booming tech scene

- In order to find the nearby venues common to all the technology hubs and for each hub:
    - Foursquare API for venue category and most popular nearby

- To find the population density and other demographic information of each respective district or city:
    - World Population Review (World Bank)

- To find the housing prices for each respective city:
    - Numbeo for property price-to-income by city, country

- To map out the world and the cities:
   - Coursera world GeoJSON file

VISUALS
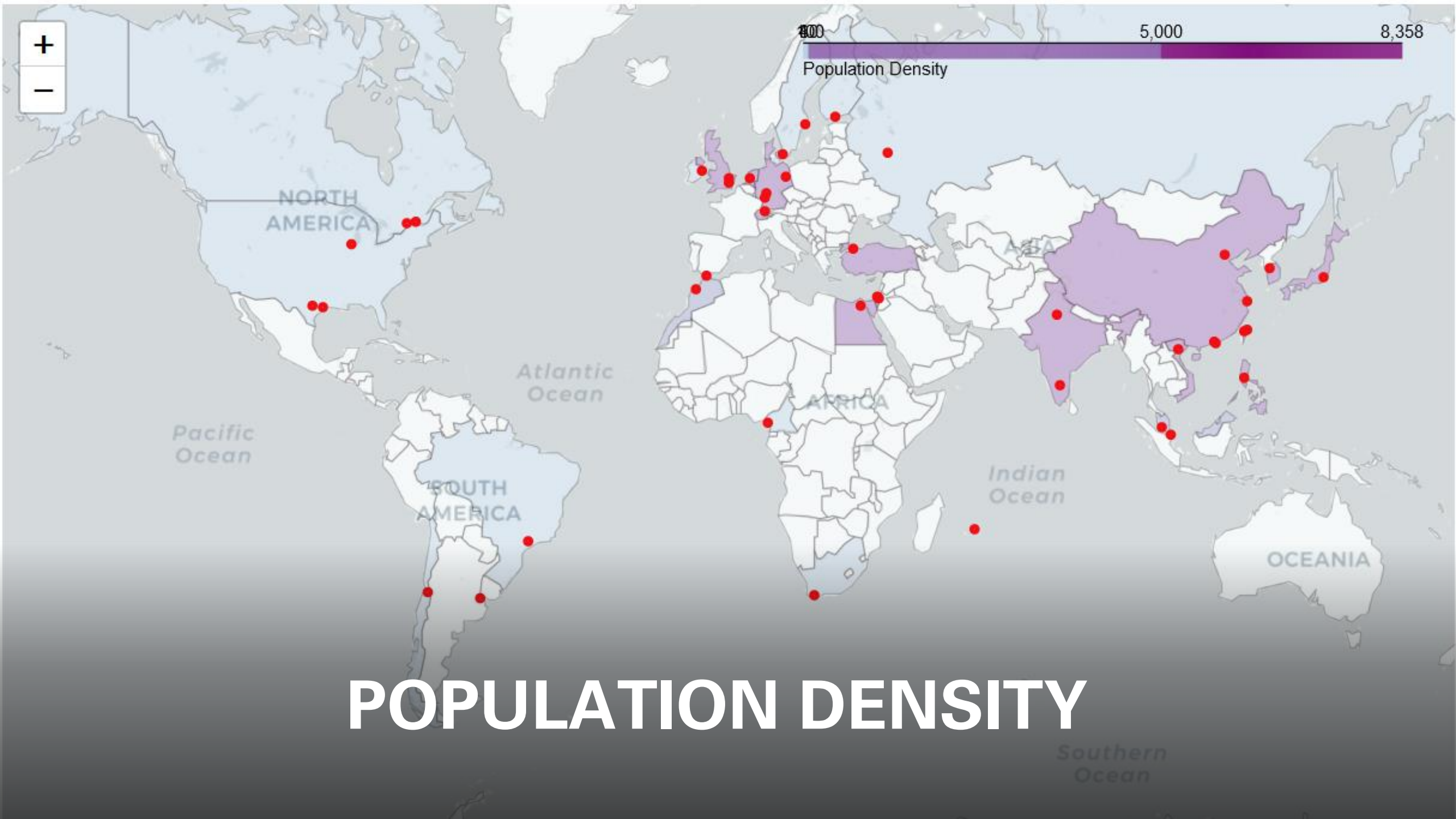
POPULATION DENSITY

BLOCKCHAIN CITIES

Blockchain Cities

	City	Latitude	Longitude	Sector
0	Beijing	39.981111	116.308889	Blockchain
1	Singapore	1.289111	103.781028	Blockchain
2	Moscow	55.697500	37.357778	Blockchain
3	Tel Aviv	32.066667	34.783333	Blockchain
4	Gilbraltar	36.133333	-5.350000	Blockchain
5	Berlin	52.520000	13.405000	Blockchain
6	London	51.525700	-0.087500	Blockchain
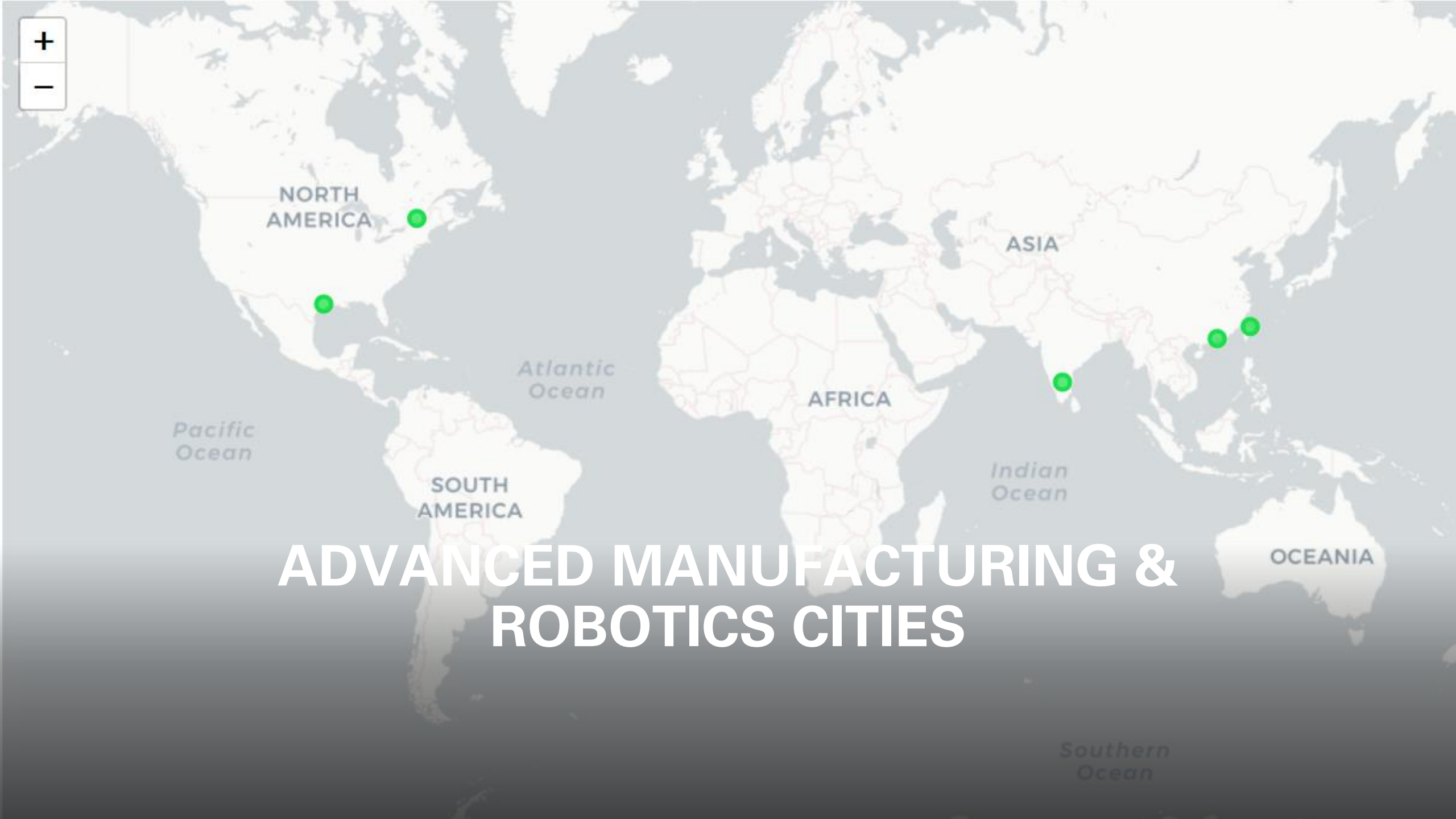
ADVANCED MANUFACTURING & ROBOTICS CITIES

Advanced manufacturing & Robotics Cities

	City	Latitude	Longitude	Sector
0	Houston	29.709510	-95.398180	Advanced manufacturing & Robotics
1	Montreal	45.498889	-73.557500	Advanced manufacturing & Robotics
2	Taipei	25.057528	121.614444	Advanced manufacturing & Robotics
3	Shenzhen	22.541500	114.059600	Advanced manufacturing & Robotics
4	Bangalore	13.050249	77.623417	Advanced manufacturing & Robotics

AI, BIG DATA & ANALYTICS CITIES

AI, Big Data & Analytics Cities

	City	Latitude	Longitude	Sector
0	Ottawa	45.420833	-75.690000	AI, Big Data & Analytics
1	Chicago	41.833333	-88.500000	AI, Big Data & Analytics
2	Austin	30.122963	-97.611422	AI, Big Data & Analytics
3	Istanbul	41.105000	29.025000	AI, Big Data & Analytics
4	Jerusalem	31.802528	35.209636	AI, Big Data & Analytics
5	Helsinki	60.183333	24.833333	AI, Big Data & Analytics
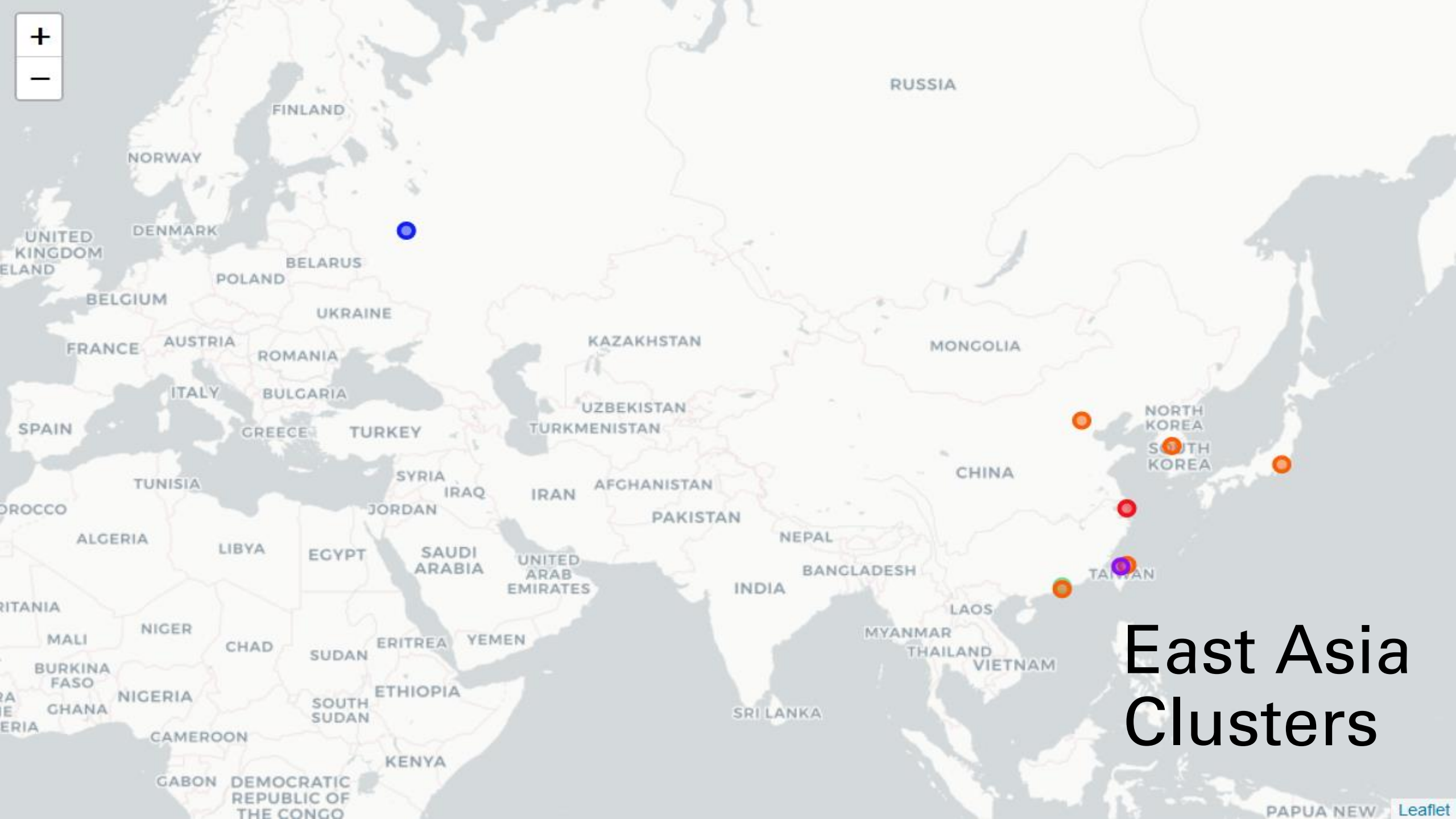
East Asia
Clusters

East Asia Clusters

	Technology Hub	City	Country	Region	Latitude	Longitude
0	Zhongguancun	Beijing	China	East Asia	39.981111	116.308889
1	Skolkovo Innovation Center	Moscow	Russia	East Asia	55.697500	37.357778
2	Nankang Software Park	Taipei	Taiwan	East Asia	25.057528	121.614444
3	Shenzhen Hi-Tech Industrial Park	Shenzhen	China	East Asia	22.541500	114.059600
4	Zhangjinag Hi-Tech Park	Shanghai	China	East Asia	31.190000	121.588000
5	Cyberport	Hong Kong Island	Hong Kong	East Asia	22.261806	114.130214
6	Tokyo City	Tokyo	Japan	East Asia	35.689722	139.692222
7	Digital Media City	Seoul	South Korea	East Asia	37.576997	126.889772
8	Hsinchu Science Park	Hsinchu City	Taiwan	East Asia	24.780000	121.013611

Southeast
Asia Clusters

Southeast Clusters

	Technology Hub	City	Country	Region	Latitude	Longitude
0	Singapore Science Park	Singapore	Singapore	Southeast Asia	1.289111	103.781028
1	Manyata Embassy Business Park	Bangalore	India	Southeast Asia	13.050249	77.623417
2	Manila Hub	Manila	Philippines	Southeast Asia	14.595800	120.977200
3	Technology Park Malaysia	Kuala Lumpar	Malaysia	Southeast Asia	3.056296	101.688919
4	Cyber City	Gurgaon	India	Southeast Asia	28.456000	77.029000
5	Hoa Lac Hi-Tech Park	Hanoi	Vietnam	Southeast Asia	20.998100	105.542200

Middle East Clusters

Middle East Clusters

	Technology Hub	City	Country	Region	Latitude	Longitude
0	Silicon Wadi	Tel Aviv	Israel	Middle East	32.066667	34.783333
1	ITU Ari Technopolis	Istanbul	Turkey	Middle East	41.105000	29.025000
2	Har Hotzvim	Jerusalem	Israel	Middle East	31.802528	35.209636
3	Jerusalem Technology Park	Jerusalem	Israel	Middle East	31.749444	35.186667

Europe Clusters
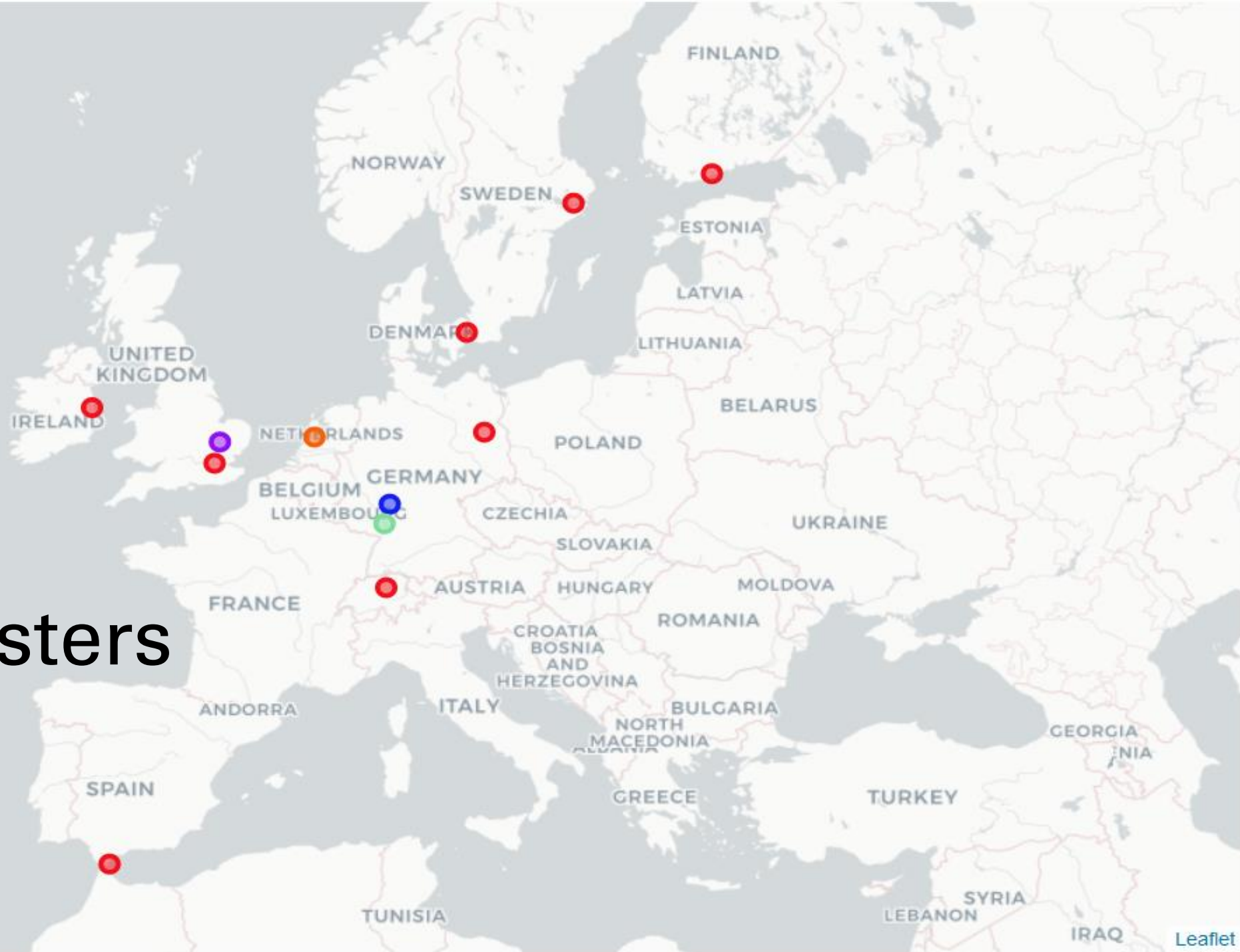
Europe Clusters

	Technology Hub	City	Country	Region	Latitude	Longitude
0	Gibraltar Hub	Gibraltar	Gibraltar	Europe	36.133333	-5.350000
1	Silicon Alle	Berlin	Germany	Europe	52.520000	13.405000
2	East London Tech City	London	United Kingdom	Europe	51.525700	-0.087500
3	IT cluster Rhine-Main	Frankfurt	Germany	Europe	50.100000	8.700000
4	IT cluster Rhine-Neckar	Frankfurt	Germany	Europe	49.443800	8.475600
5	Otaniemi	Helsinki	Finland	Europe	60.183333	24.833333
6	Silicon Docks	Dublin	Ireland	Europe	53.343497	-6.237620
7	Kista	Stockholm	Sweden	Europe	59.401389	17.944444
8	Copenhagen Hub	Copenhagen	Denmark	Europe	55.676111	12.568333
9	Amsterdam Science Park	Amsterdam	Netherlands	Europe	52.356000	4.953000
10	Crypto Valley	Zug	Switzerland	Europe	47.166667	8.516667
11	Silicon Fen	Cambridge	United Kingdom	Europe	52.233889	0.144444
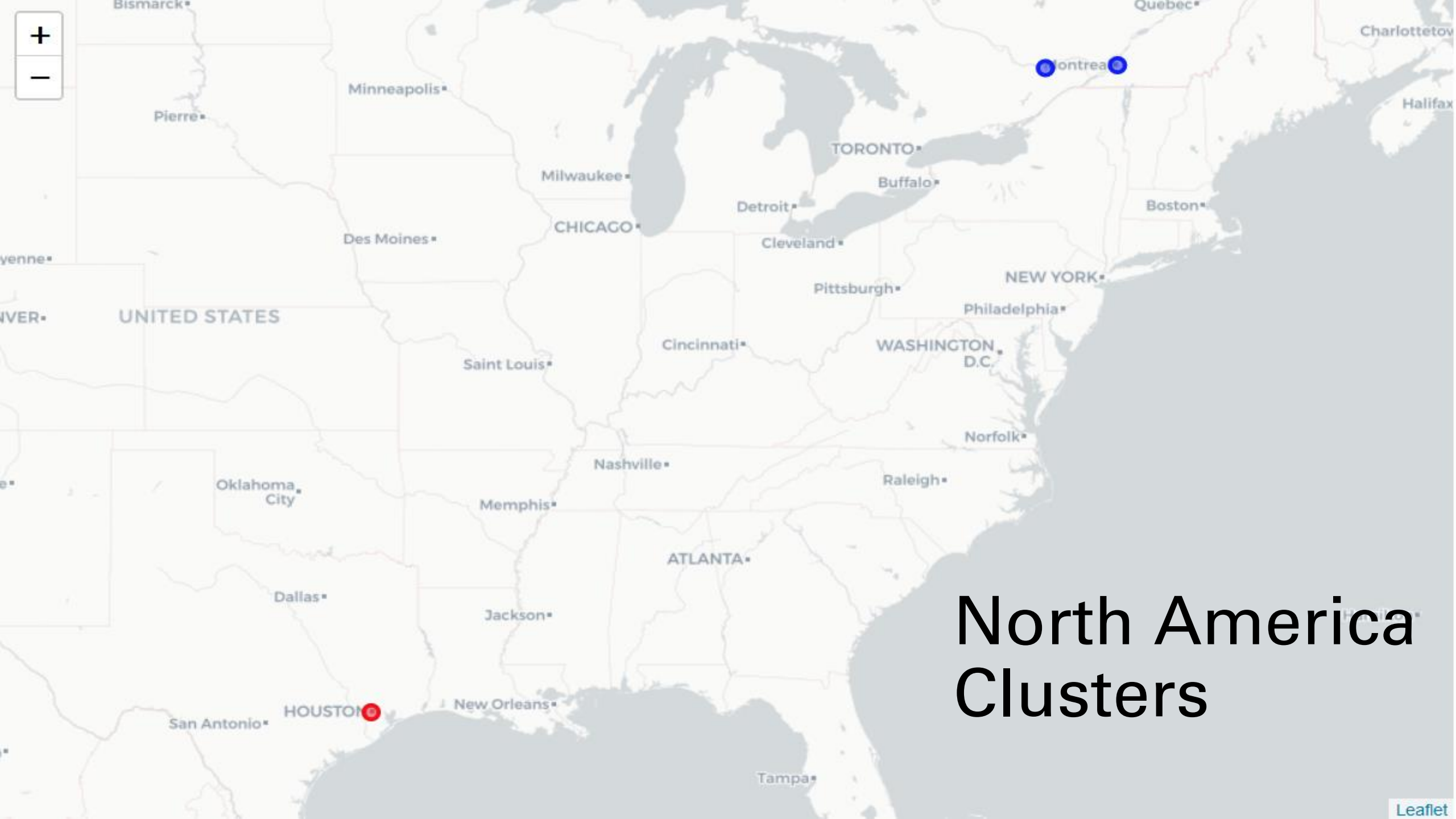
North America Clusters

North America Clusters

	Technology Hub	City	Country	Region	Latitude	Longitude
0	Texas Medical Center	Houston	United States of America	North America	29.709510	-95.398180
1	Cite du Multimedia	Montreal	Canada	North America	45.498889	-73.557500
2	Silicon Valley North	Ottawa	Canada	North America	45.420833	-75.690000
3	Illinois Technology & Research Corridor	Chicago	United States of America	North America	41.833333	-88.500000
4	Silicon Hills	Austin	United States of America	North America	30.122963	-97.611422

South America Clusters

South America Clusters

	Technology Hub	City	Country	Region	Latitude	Longitude
0	Buenos Aires Hub	Buenos Aires	Argentia	South America	-34.603333	-58.381667
1	Chilecon Valley	Santiago	Chile	South America	-33.450000	-70.766667
2	Campinas	Sao Paulo	Brazil	South America	-22.900833	-47.057222

Africa Clusters

Africa Clusters

	Technology Hub	City	Country	Region	Latitude	Longitude
0	Silicon Cape	Cape Town	South Africa	Africa	-34.000000	20.000000
1	Casablanca Technopark	Casablanca	Morocco	Africa	33.543000	-7.641000
2	Silicon Mountain	Buea	Cameroon	Africa	4.152700	9.241000
3	Smart Village	Cairo	Egypt	Africa	30.076667	31.018889
4	Ebene Cyber City	Ebene	Mauritius	Africa	-20.243056	57.491667

Results

Region	Clusters	% Food Related Venues
East Asia	Cluster zero	60%
	Cluster one	50%
	Cluster two	70%
	Cluster three	74%
	Cluster four	50%
Southeast Asia	Cluster zero	70%
	Cluster one	80%
Middle East	Cluster zero	40%
	Cluster one	85%
	Cluster two	50%
Europe	Cluster zero	40%
	Cluster one	56%
	Cluster two	70%
	Cluster three	50%
	Cluster four	50%
North America	Cluster zero	75%
	Cluster one	80%
South America	Cluster zero	55%
	Cluster one	50%
Africa	Cluster zero	65%
	Cluster one	40%
	Cluster two	50%

Discussion

- Most common venues for all clusters were directly related to food.

- The average of food related venues for all region was 60%

- The average of food related venues for major metropolitan areas was 69%

- Similar restaurants within the food related venues ranged from: Italian, Chinese, Japanese, Middle Eastern, and Mexican

- Other similar venues related to recreational/attraction

- Many of these clusters resemble each other with respect to common venues

Conclusion & Future Direction

There are many technology hubs worldwide that are experiencing vast growth and should be focused on as they create waves in the industry

Clustering could be more specific to cities rather than regions

More data could be useful for further research for a larger and more well constructed view of each technology hub