Interest Networks (iNETs) for Cities: Cross-Platform Insights and Urban Behavior Explanations

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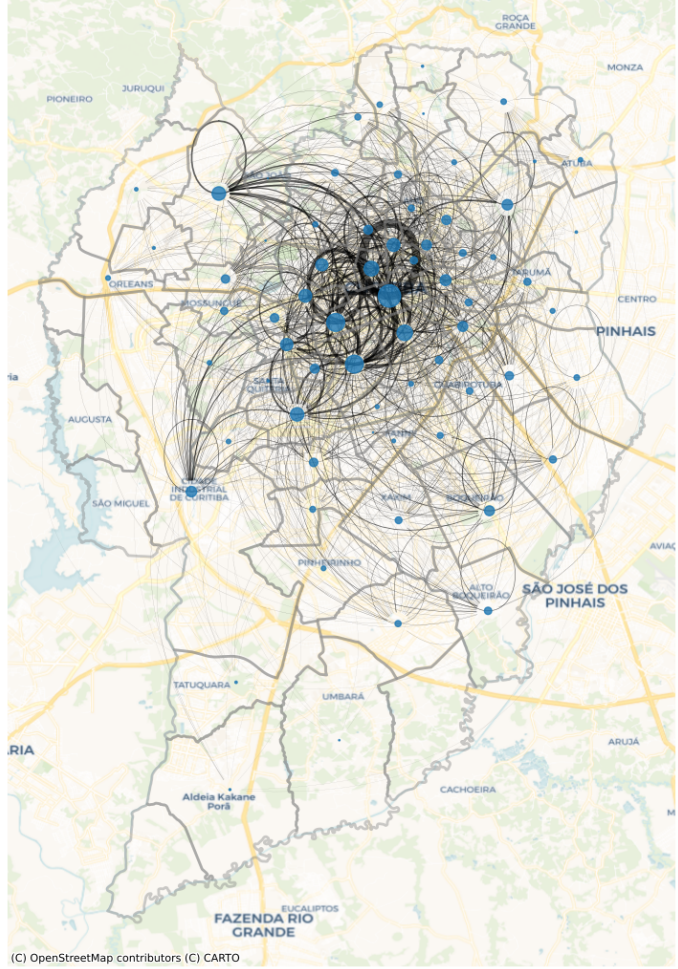
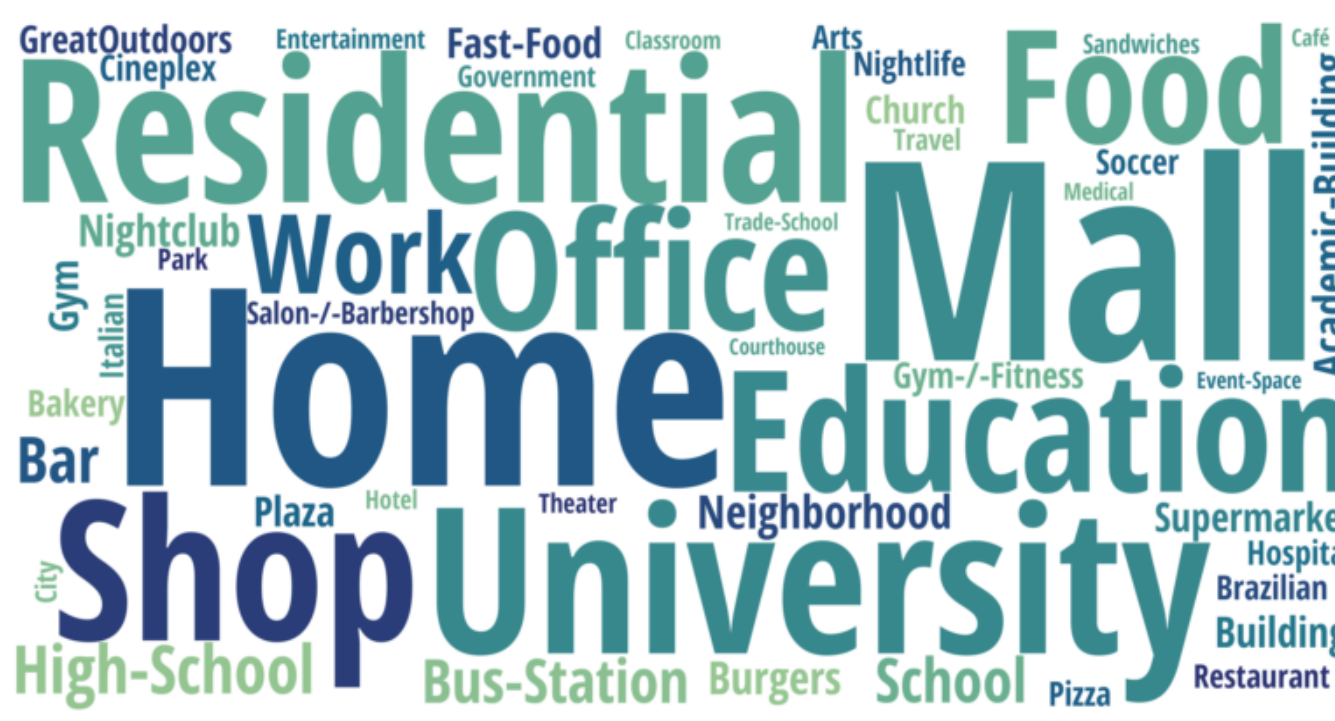Paper | Website

Introduction

➤ **LBSNs**, such as **Google Places** and **Foursquare**, provide rich datasets.
➤ We study **urban behavior** through **Interest Networks (iNETs)**, with them:
  ➤ How to **understand interest** in urban areas?
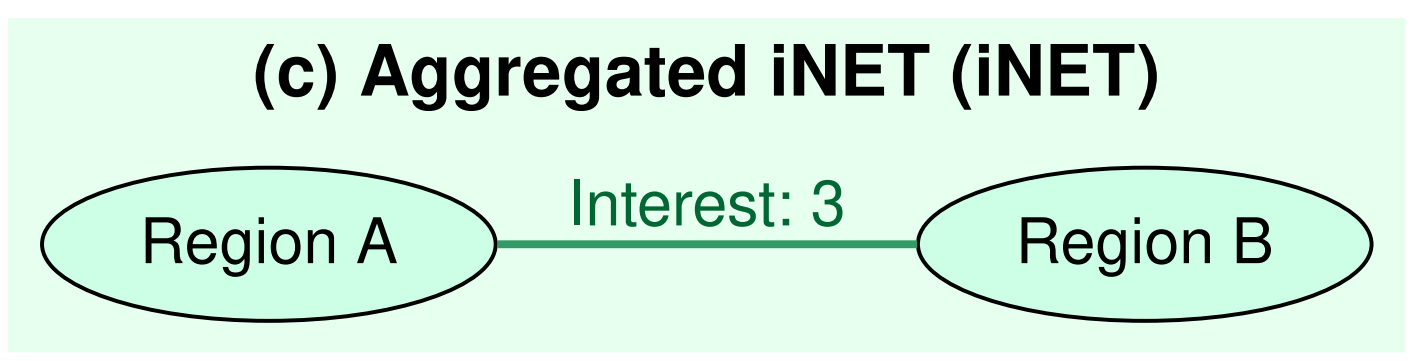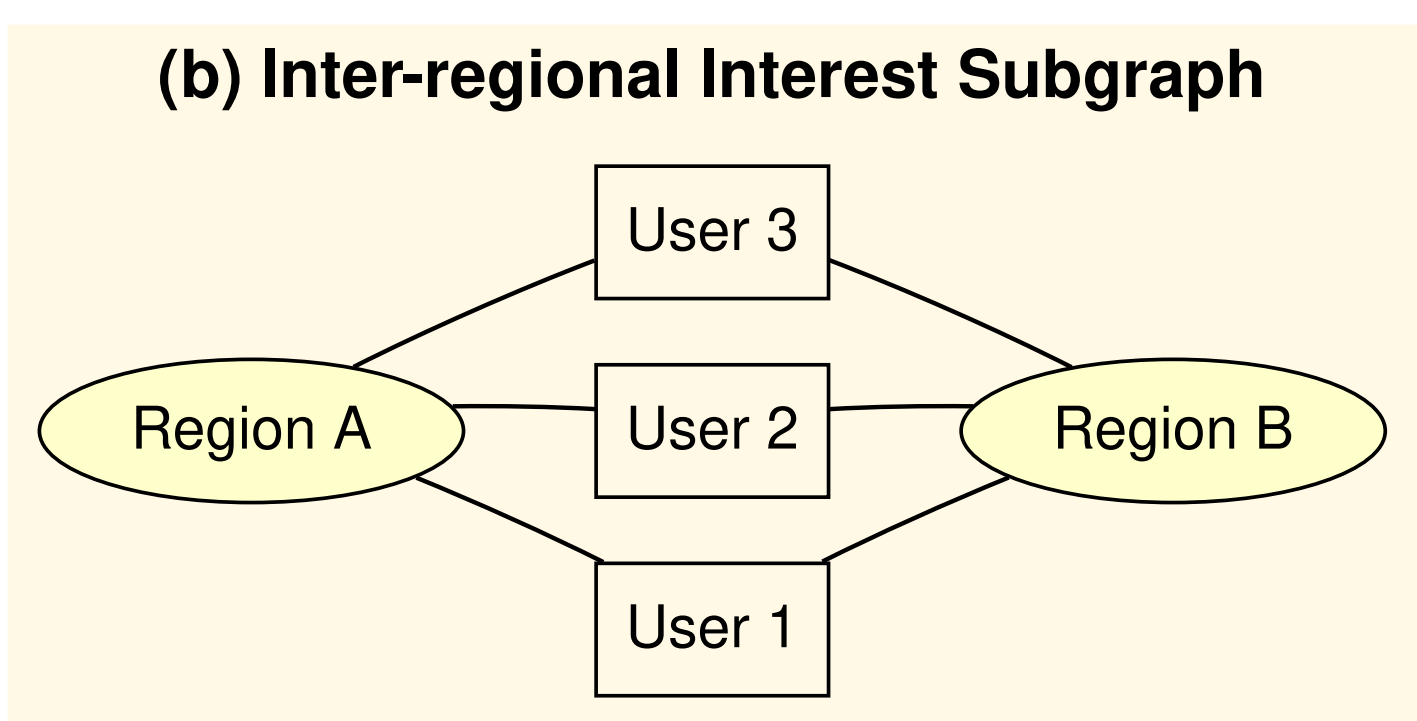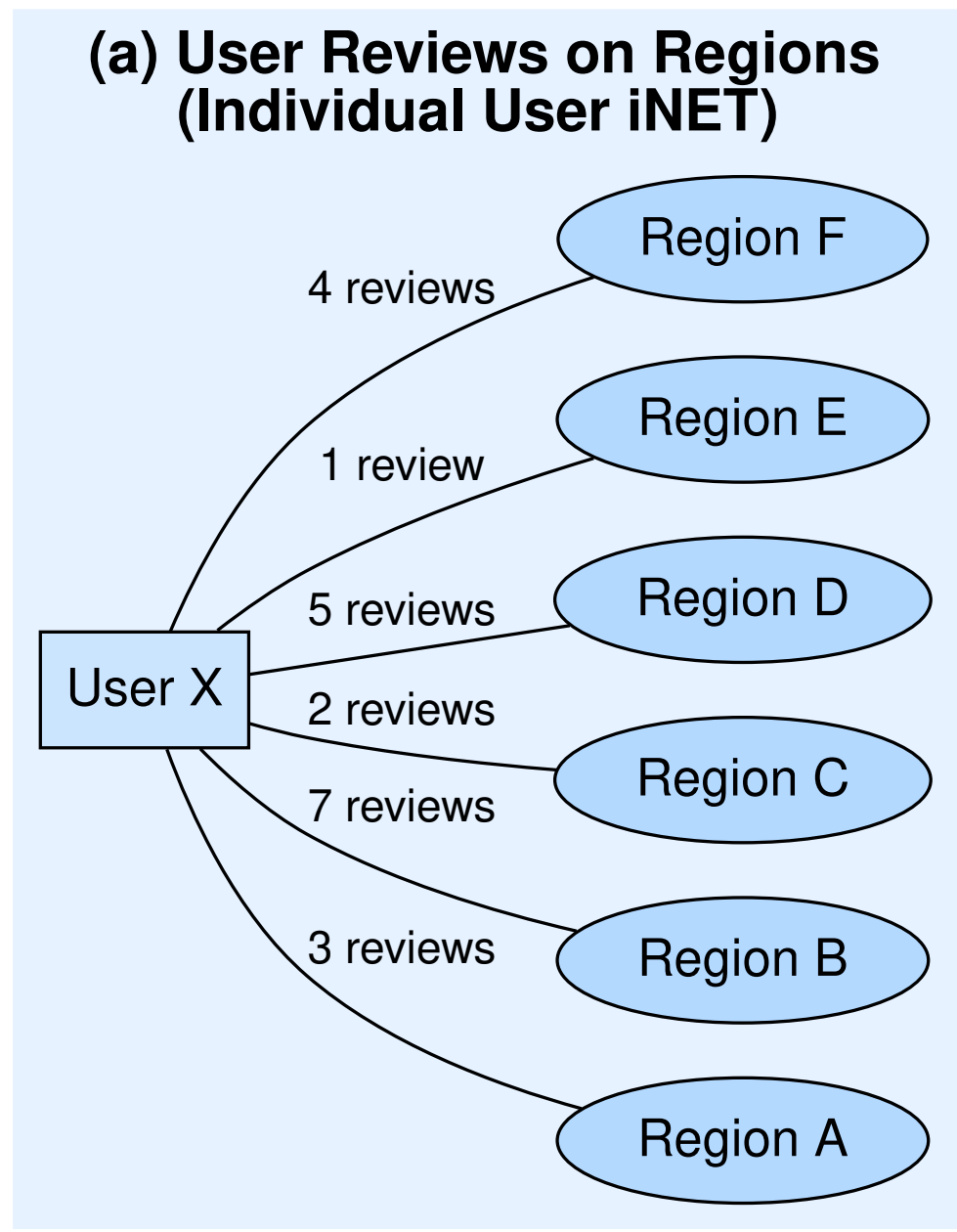 ➤ Findings are **similar across LBSNs?**

Data

➤ **600M Reviews** in Google Places in USA.
➤ Smaller **Google Places** data over the world.
➤ **Foursquare** data in several countries.
➤ Enriched with **socieconomic**, **political** and **cultural** attributes.
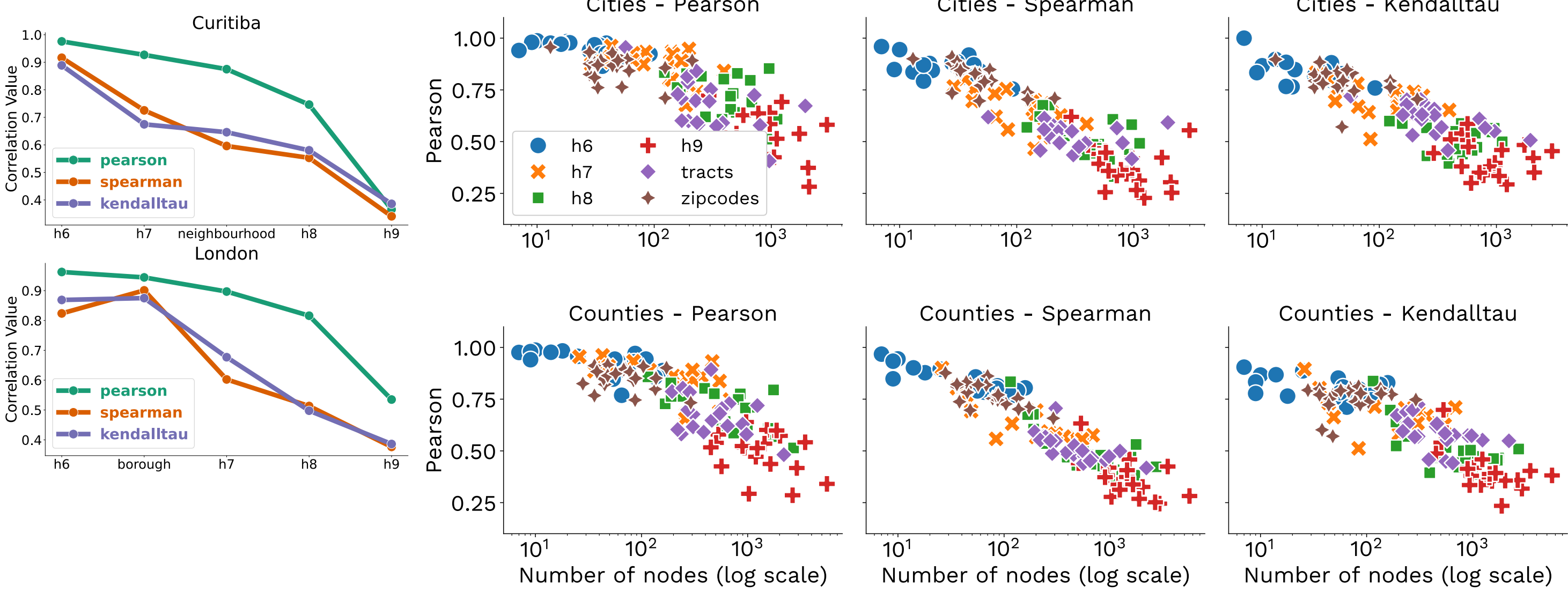➤ Census Tracts, ZipCodes, H3 Cells, Neighborhoods, Boroughts - **Spatial Granularities.**

Modelling iNETs

➤ **Interest Networks** (iNETs) are undirected **weighted** graphs.
➤ **Edges** connect **regions**. **Weights** represent the **number of people** that visited the **connected** areas.

(a) User Reviews on Regions (Individual User iNET)
(b) Inter-regional Interest Subgraph
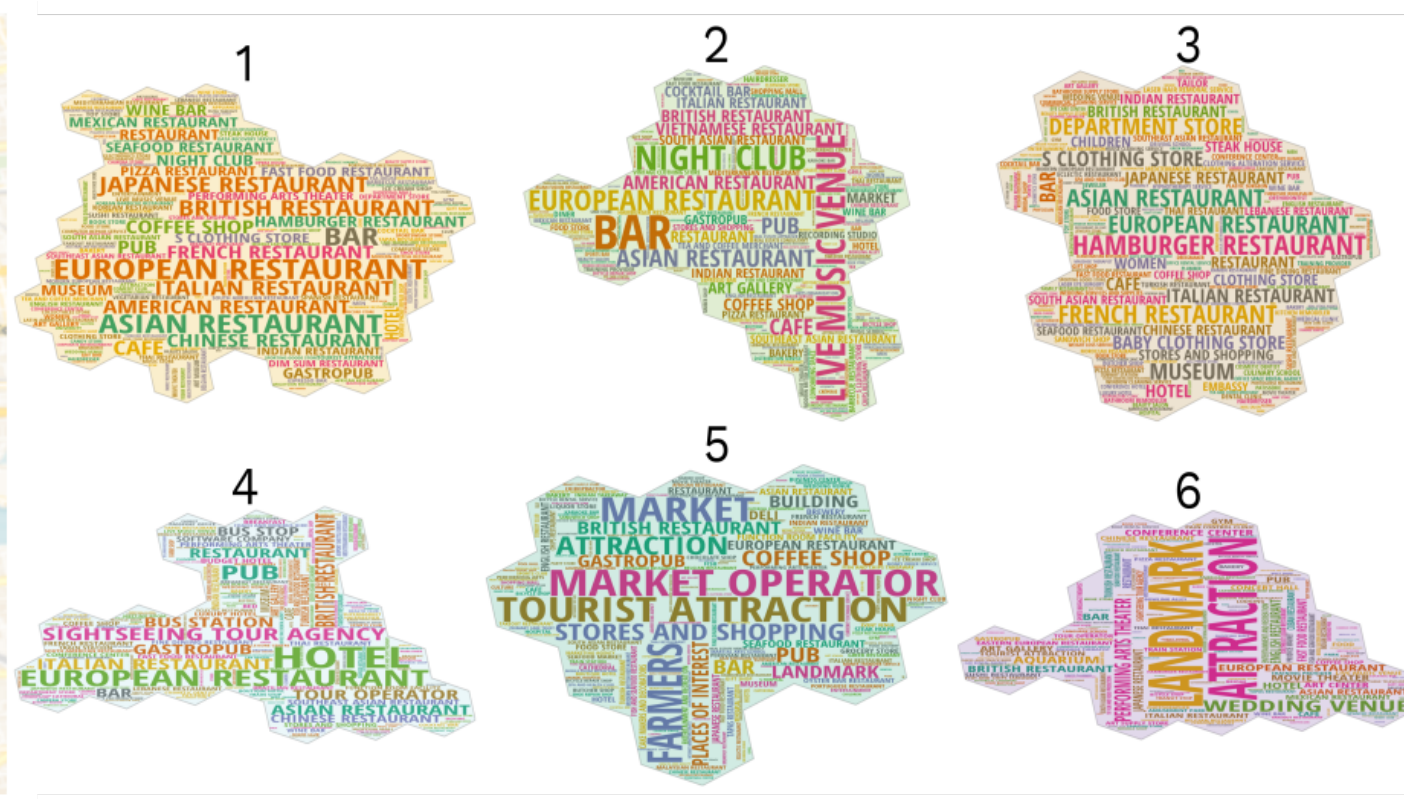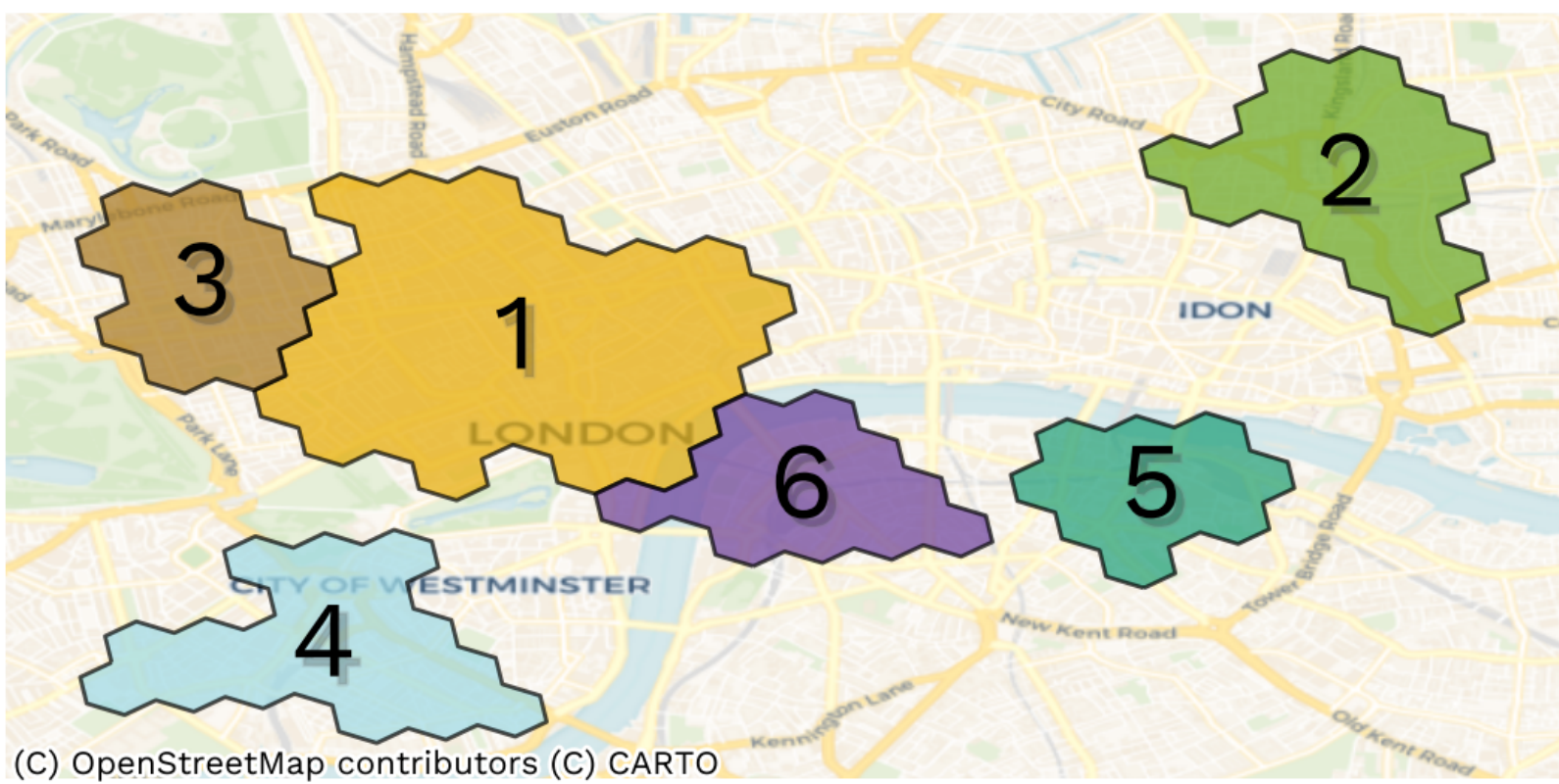(c) Aggregated iNET (iNET)

Similarity: Granularities & Platforms

➤ **Top 20** Counties/Cities in **USA; London** and **Curitiba.**
➤ Compared **Edge Weights** using **Pearson/Spearman.**
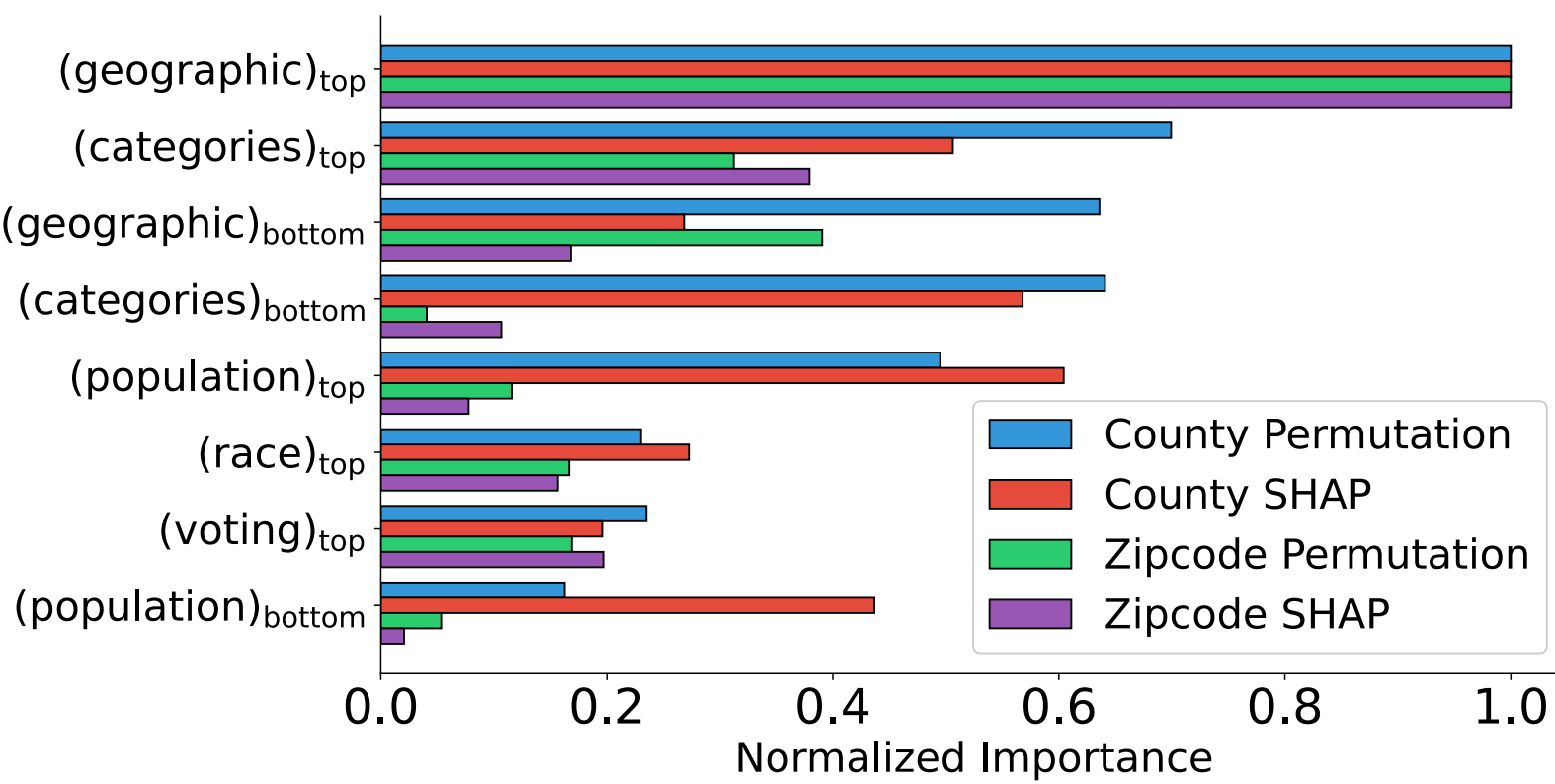➤ Compared **Node Importance** with **Kendall's Tau.**

UPZones

➤ Urban Preference Zones (**UPZones**) are **behaviorally coherent clusters** that move beyond administrative borders.
➤ **UPZones** are **densely connected,** geographically adjacent zones using the h9 granularity level within iNETs.
➤ UPZones were found to be **similar** across LBSNs in London
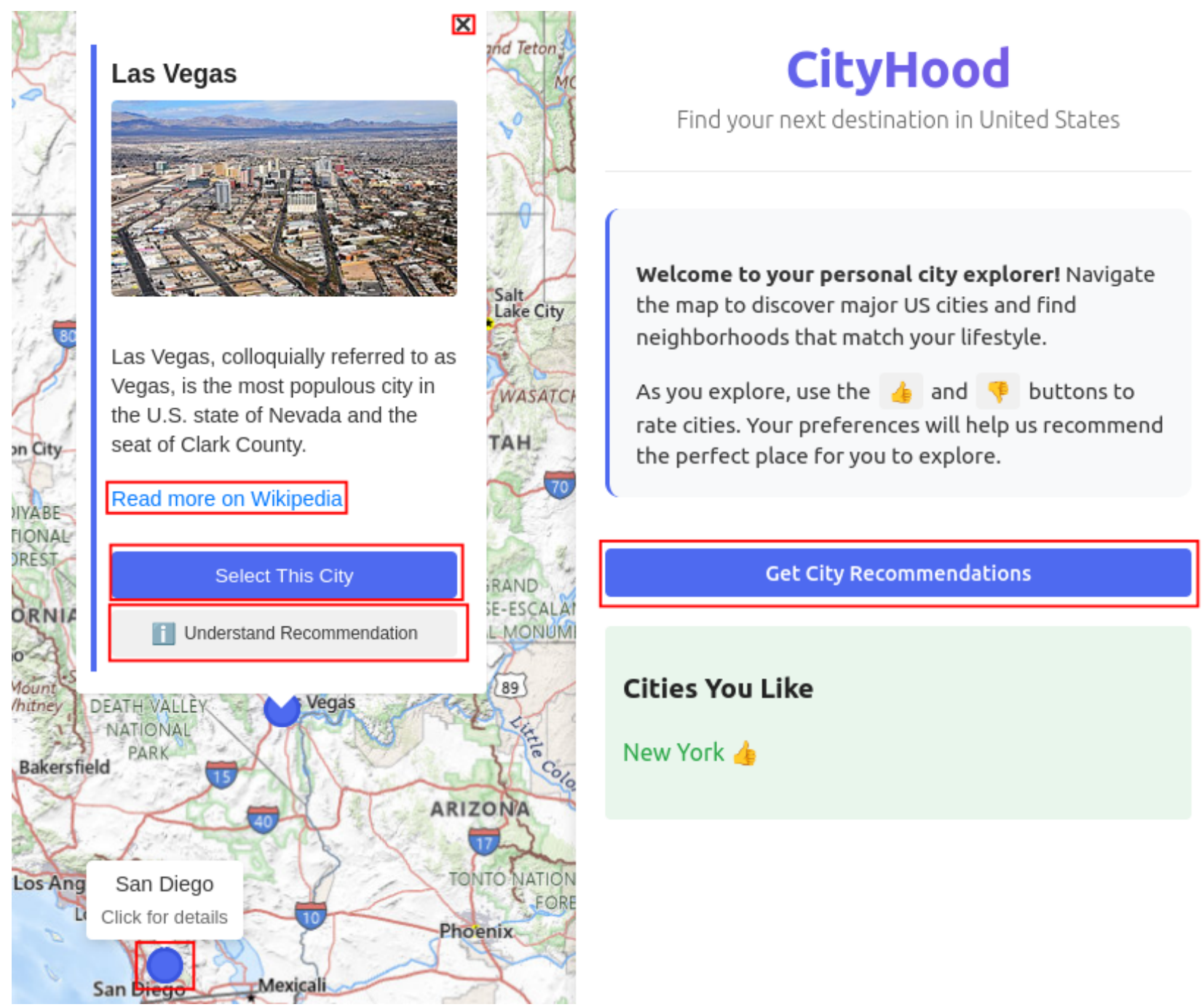

Understanding Interest

➤ Analyzed the **Interest** with the **region descriptors** and **similarities**
➤ **Interest patterns** are primarily shaped by **geographic proximity** and **venue similarity**, with **socioeconomic** and **political** factors having a **lesser influence**.

	Google Places	Foursquare
Population	-0.14	-0.03
Income Differences	-0.17	-0.06
Cultural Affinity	-0.28	0.00
Political Polarization	-0.26	-0.14
Venues Similarity	0.33	0.12
Racial Composition	-0.26	-0.14
Education Levels	-0.33	-0.23
Geographic Distance	-0.4	-0.42

Demos & Tools

➤ The **CityHood demo** allows users to explore **personalized** city and neighborhood recommendations based on past preferences, enhanced with **AI-powered explainability.**

➤ The **H3-Cities tool** integrates **OpenStreetMap** with **Uber's H3**, allowing for **multi-scale** spatial analysis by subdividing cities into **hexagons** of various resolutions.