When ‘Spatial’ Means Special

Spatial Analytics

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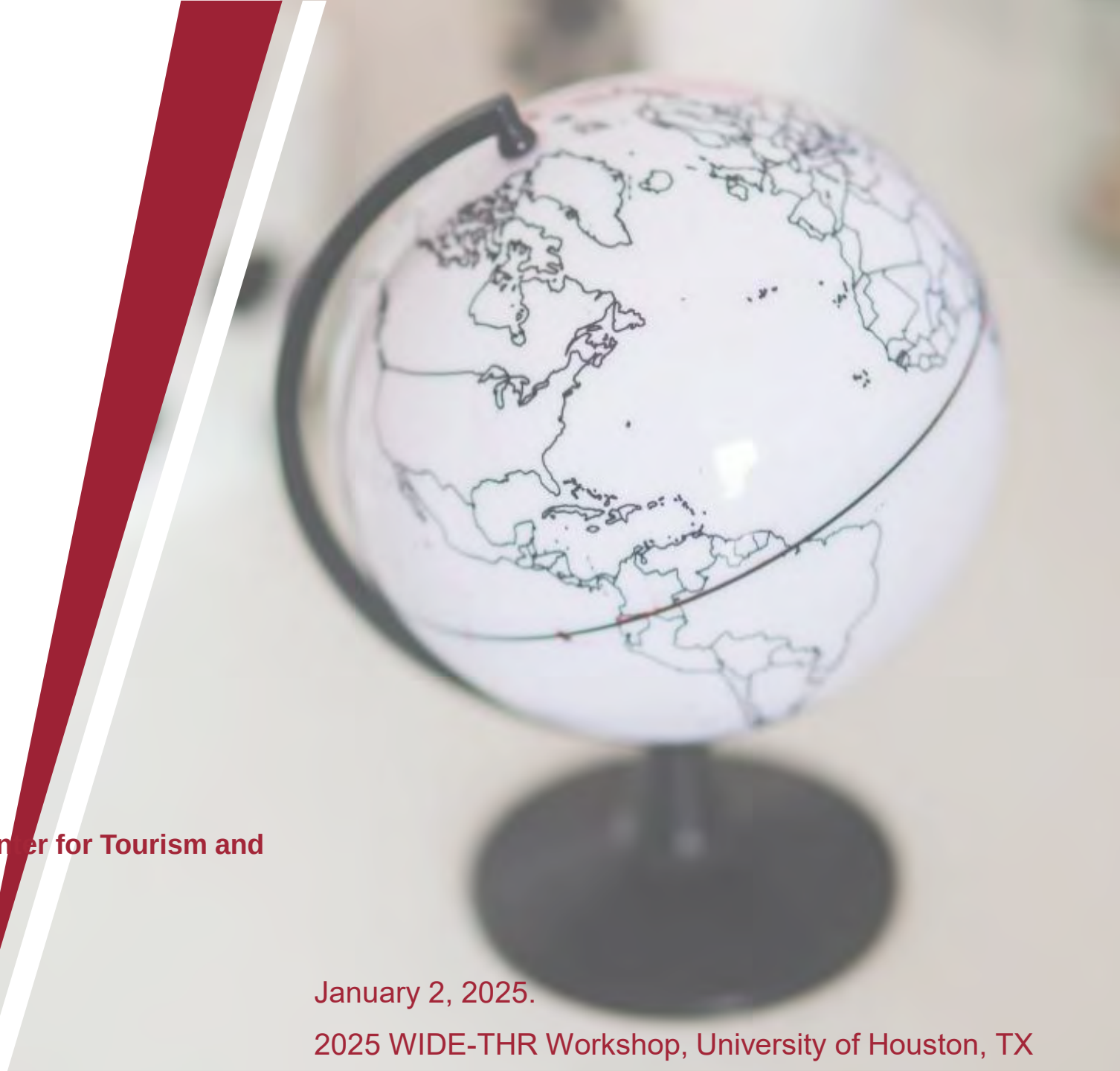

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Introduction: Why ‘spatial’?

Spatial nature

- Tourist flows follow the general characteristics as a type of geographic flows

Location reliance

- Geographic location largely shapes the occurrence, nature, and impact of tourism activities.

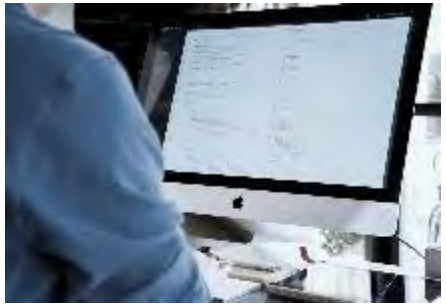
Spillovers

- Observed across business units and destinations via spatial competition and agglomeration.

Evolution of data

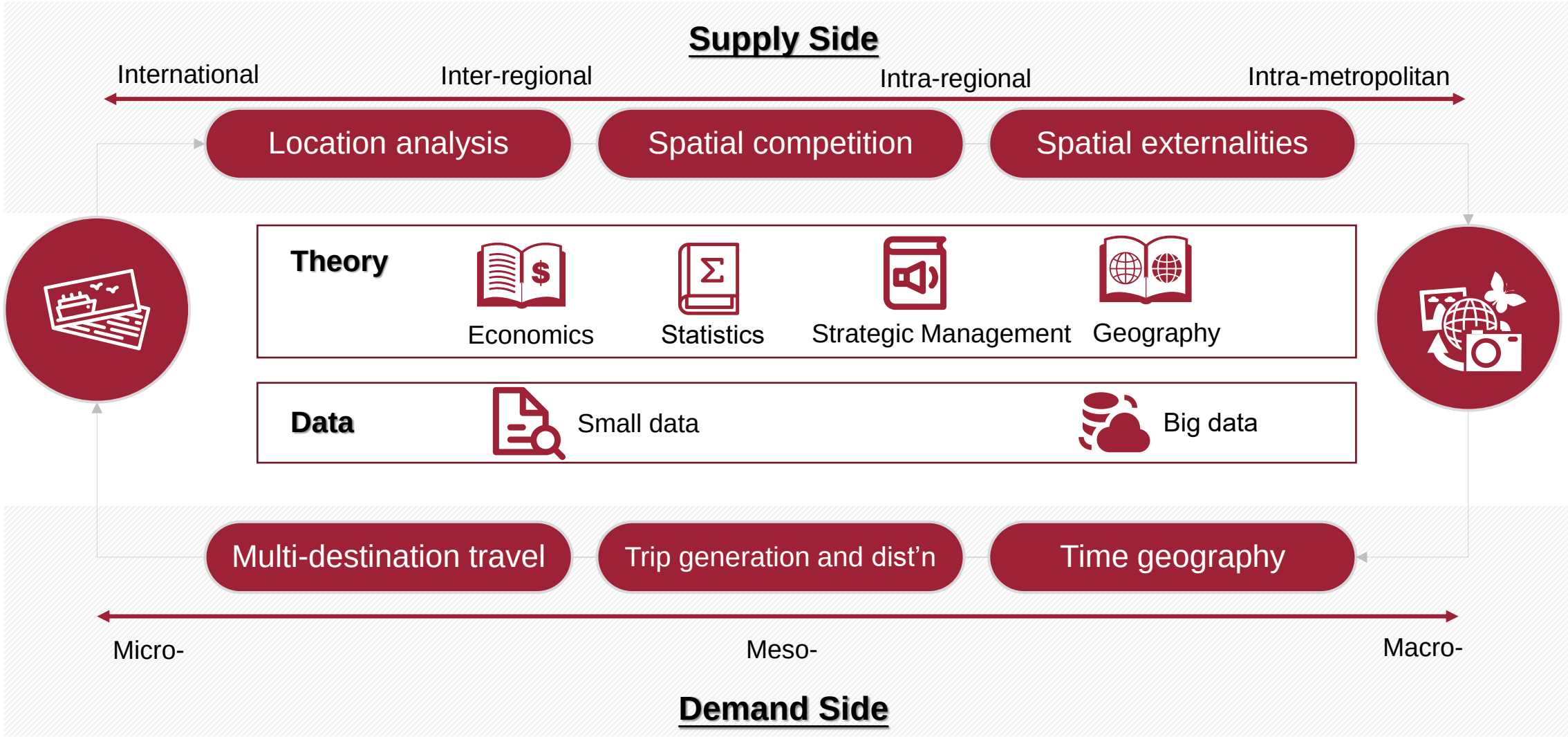
- Growing popularity of various big data sources conveying geospatial information.

Analytic tools



- Methods of spatial analytics are also proliferating, such as GIS and spatial statistics.

Introduction: Spatial Analytics



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Demand side analysis

- A micro-econometric model of multi-destination travel based on travel route geometry.

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Supply side analysis

- Analysis of productivity spillovers (as a type of spatial externalities) from branded to independent hotels.

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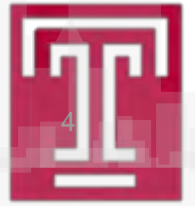
Other studies

- Geo-spatial analysis in non-geographic spaces and consulting projects using geo-spatial modelling.

04

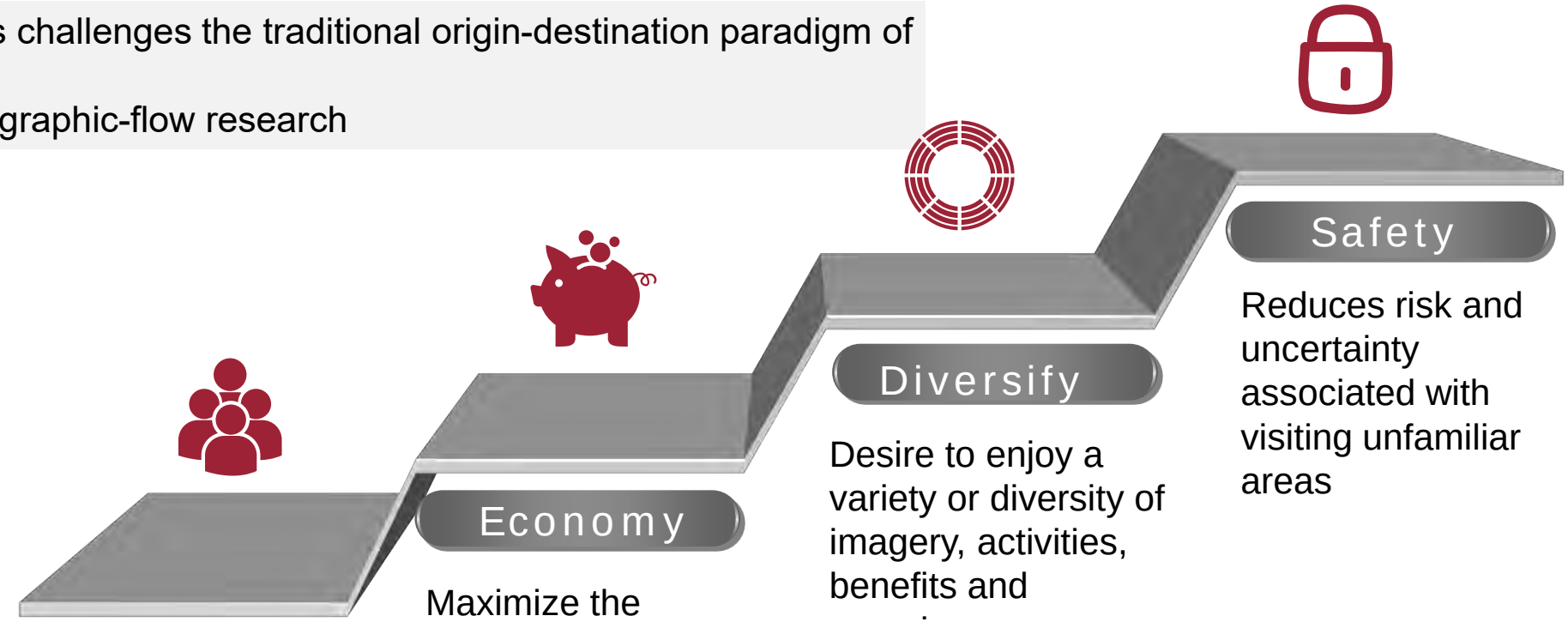
Future

- Interesting and challenging topics deserving future research efforts.



1. Demand side analysis - Multi-destination travel

- Multi-destination travel is popular in tourism.
- This challenges the traditional origin-destination paradigm of geographic-flow research

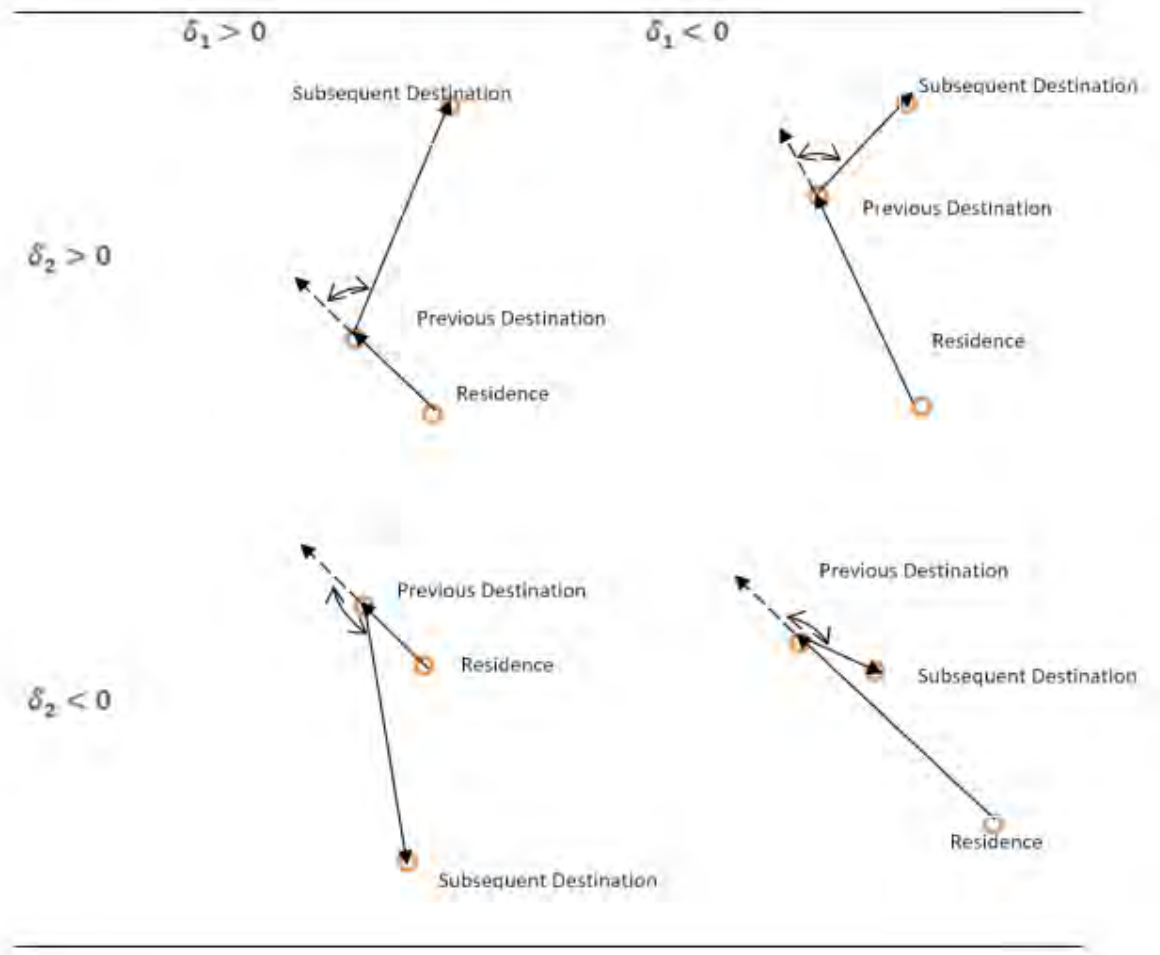


1. Demand side analysis - Multi-destination travel

A province-wide domestic tourist survey in Jiangsu China, which covers 30,283 valid respondents. It covers the information on multi-destination travel.

If $\delta_1 > 0$, tourist travels a longer distance to the subsequent destination from the previous one.

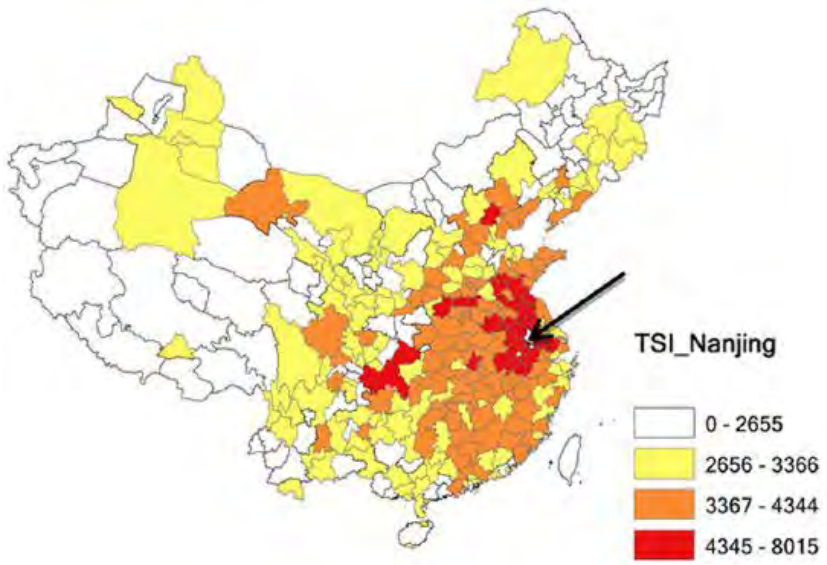
If $\delta_2 > 0$, tourist travels further to a subsequent destination that is more distant from his or her residence.

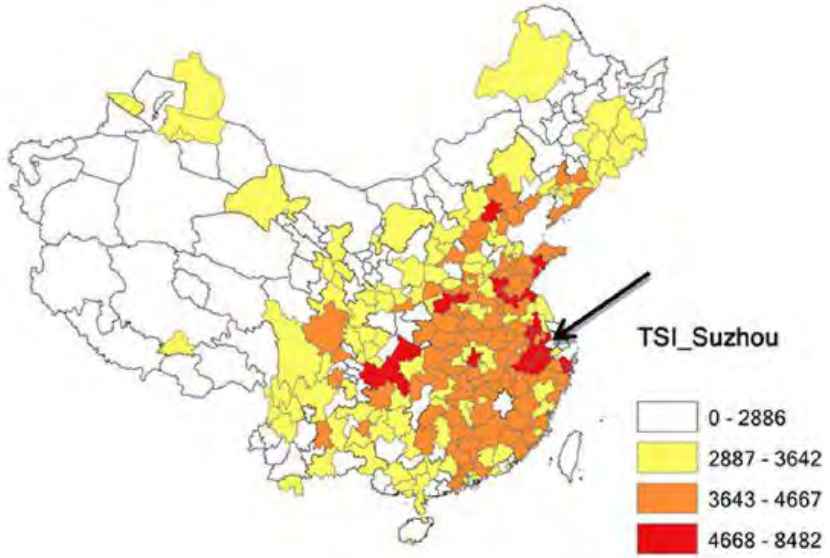


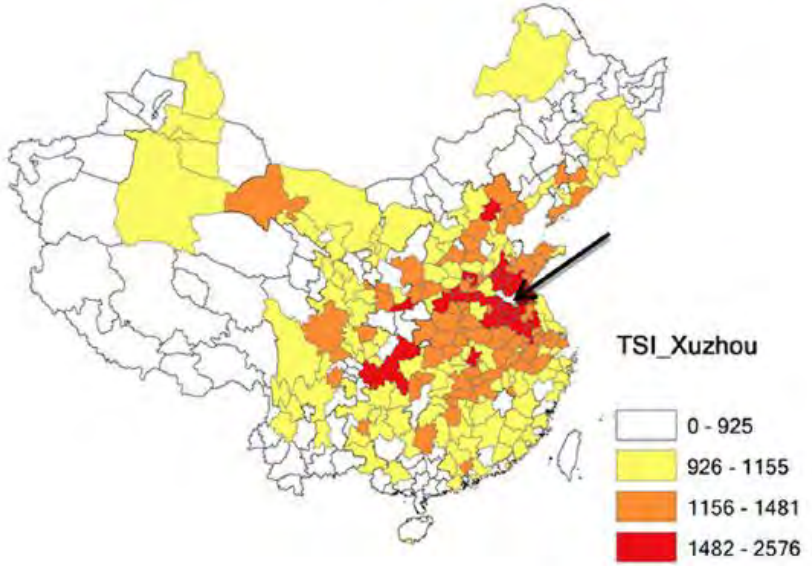
1. Demand side analysis - Multi-destination travel

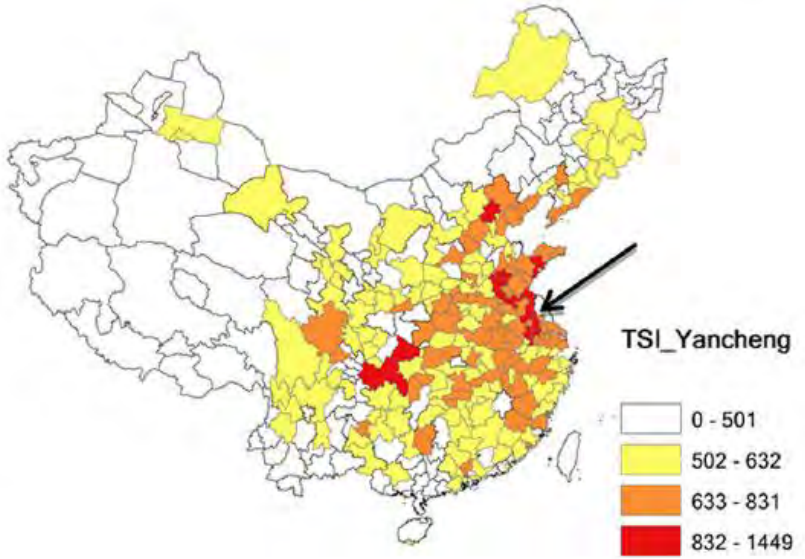
Results of TSI based on

different “first-destinations”









1. Demand side analysis – Air quality perception

Contents lists available at ScienceDirect

Annals of Tourism Research

journal homepage: www.elsevier.com/locate/annals

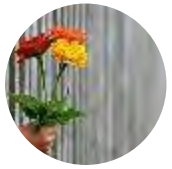
Research article

Designing tourist experiences amidst air pollution: A spatial analytical approach using social media

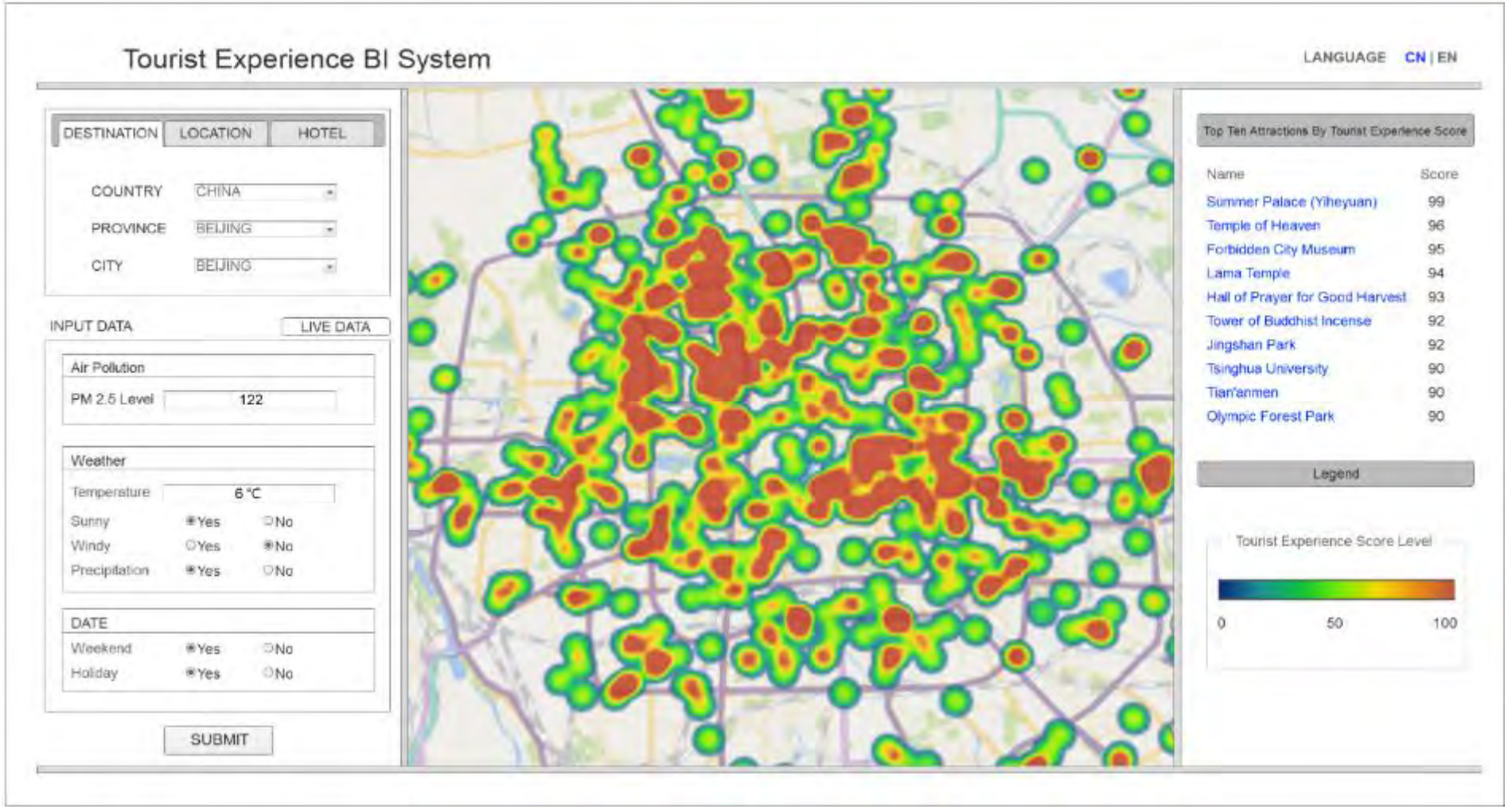
Xiaowei Zhang[a], Yang Yang[b,*], Yi Zhang[c], Zili Zhang[a]

Impact of Air Pollution

(Measured by PM 2.5 concentration level)

Smog Awareness	Behavioral Consequence	Emotional Consequence	Health Consequence
			
Whether the tourists are aware of the issue of air pollution, such as smog attacks	How tourists change their behavior in terms of location visited, travel scope, and duration.	How tourists' emotion and sentiment change.	The occurrence of health related issues such as illness and insomnia.

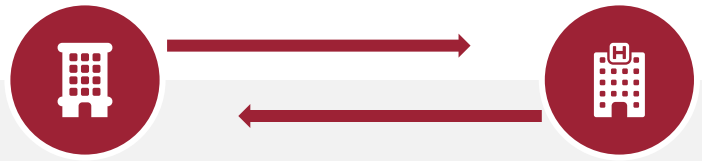
1. Demand side analysis – Air quality perception



2. Supply side analysis – Your neighbor matters

Spillovers：conditions under which firms can acquire information created by others without paying for that information in an economic transaction

- spillover-generating firms must possess some advantages over receiving firms.
- channels for transferring the externalities



Independent hotels

Lack sufficient resources due to both a small ownership structure and no brand affiliation, (O'Neill & Carback, 2011).

Chained hotels

Valuable resources such as marketing, operational, and technological assistance from franchisors

Dichotomy of independent and chained hotels

2. Supply side analysis – Your neighbor matters

Hypotheses ›››

1. Larger size independent hotels leverage more spillovers.
2. Younger independent hotels can leverage more spillovers.
3. Hotels in a market with more intense competition leverage more spillovers.
4. Compared to chain-operated hotels, franchised branded hotels contribute to more spillovers.

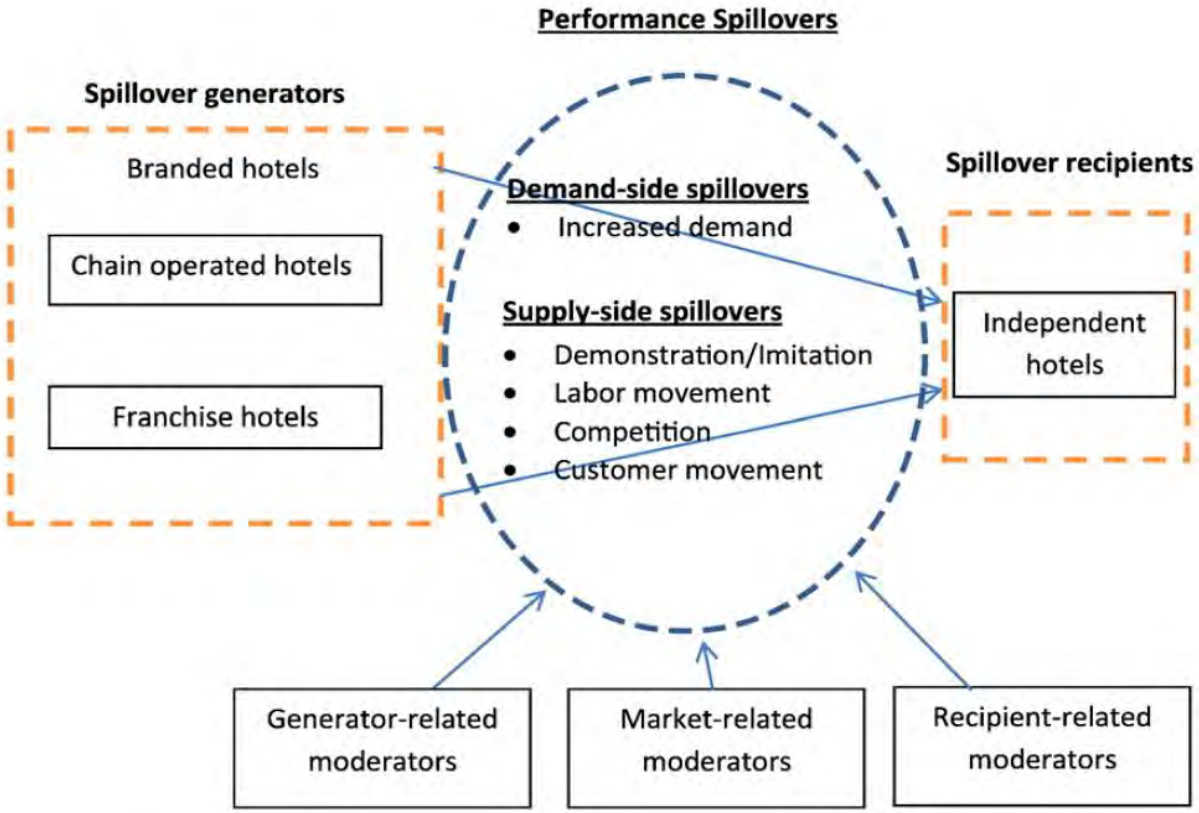


Fig. 1. Framework of performance spillovers from branded to independent hotel properties.

2. Supply side analysis – Your neighbor matters

Research methods

- Texas hotel property data (2008-2014).
- Regressed the performance of spillover recipients on the presence of spillover generators after controlling for other variables.

Conclusions

- Results confirmed a moderate level of spillovers.
- Spillovers were predominately generated by franchised hotels and largely attributed by high-class branded hotels.
- Younger independent hotels reaped more spillovers from branded hotels

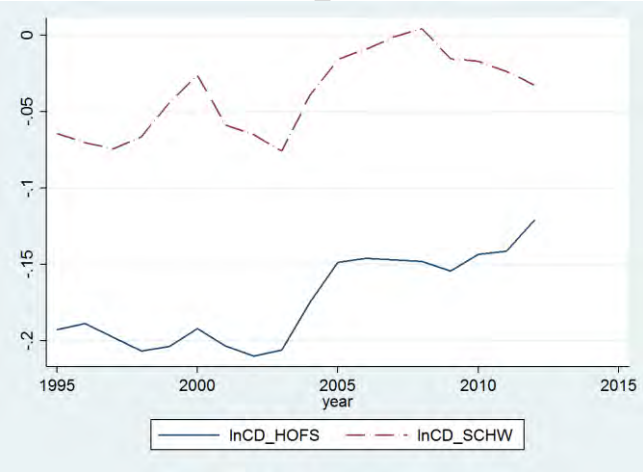
Implications

- Some independent hotels have to increase their absorptive capacity to better reap the spillovers from branded hotels.
  - Employee training
  - Social networking
  - Hotel exhibition
  - Technology advancement
  - Association assistance

3. Other studies and projects – Non-geographic space

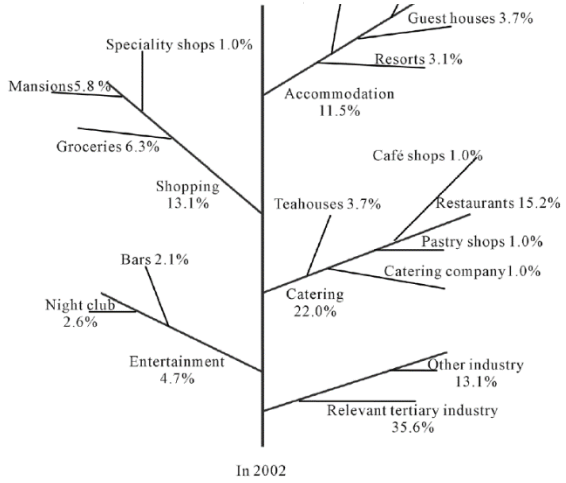
Cultural

- Negative and significant effect of CD on international tourist flows.
- Economic globalization and technology advancement explained the declining effect of CD.



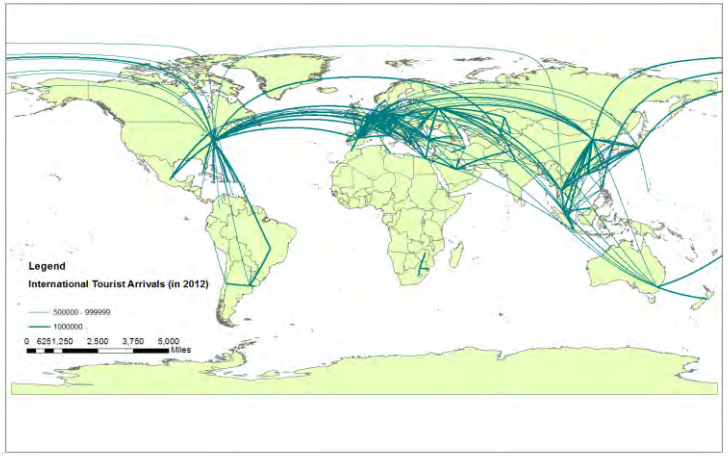
Social

- Position in the social network decides residents' tourism support.
- Family connectedness and job connections explains most.



Virtual

- Tourism websites are inter-connected in virtual space.
- Their virtual proximity heavily shapes web traffic patterns.



3. Geo-spatial data integration

GPS track of vehicles

Social media

Cell phone roaming

User Generate Content

Credit card transaction

Search engine query/
web traffic

3. Geo-spatial data integration

Calibrating the sales revenue from tourists

Propose a geo-spatial model to predict the % of revenue from tourists for each single business locations in a U.S. state.

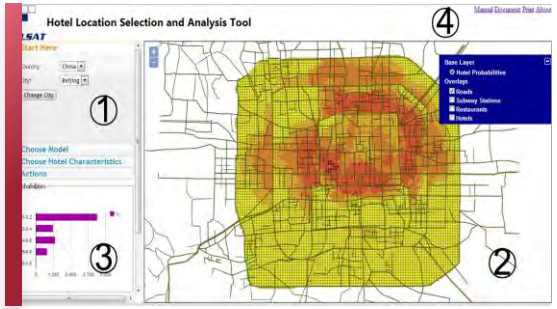
GIS and spatial data base

- Set up a GIS database covering more than 2 mil business locations across the state.
- Design and distribute a questionnaire to a collect the data.

Spatial data mining and simulation

- Propose a machine learning model to predict tourist revenue based on survey data.
- Calibrate the tourist revenue % of all business properties.

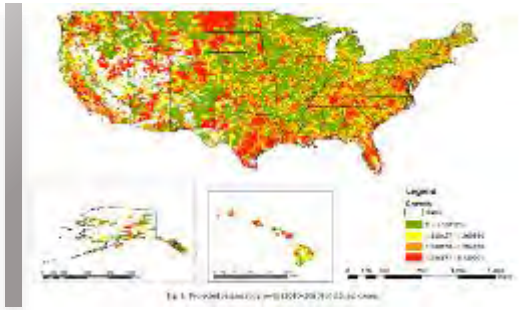
3. Geo-spatial data integration



1 ***Yang, Y.,*** Tang, J., Luo, H. and Law, R. (2015). Hotel location evaluation: A combination of machine learning tools and web-GIS. *International Journal of Hospitality Management*, 47, 14-24.

GIS and Hotel Location

Used for analyzing and optimizing hotel location decisions, integrating multidimensional data (such as transportation, competition, population, etc.) to provide intuitive spatial visualization and scientific decision-making support.



2 Yang, Y., Roehl, W. S., & Huang, J. H. (2017). Understanding and projecting the restaurantscape: The influence of neighborhood sociodemographic characteristics on restaurant location. *International Journal of Hospitality Management*, 67, 33-45.

Projecting Restaurant Growth

We investigate the relationship between neighborhood sociodemographic characteristics and restaurant location using a unique data set from 2013 covering 30,772 U.S. zip codes

3 ***Yang, Y.,*** et al. "Monitoring the global COVID-19 impact on tourism: The COVID19tourism index." *Annals of Tourism Research* 90 (2021): 103120.

COVID19tourism Index

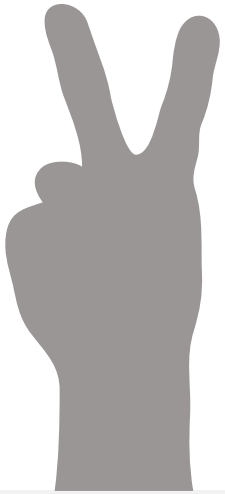
COVID19tourism index helps the industry gauge the recovery level compared to the “normal time” without Covid19. A level of 100 indicates the recovery to the normal level. Five sub-indexes include Aviation Index, Hotel Index, Pandemic Index, Interest Index, and Mobility Index.

4. Future….

Better analyze the travel route of tourists at different scales.

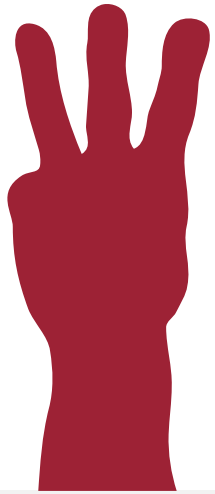
Time-geog.

A more comprehensive understanding with multiple sources of geo-spatial data.



Emerging data

(Spatial) econometric and statistics models more specific to tourism research



Tailored tool

How various accessibility change (i.e., transport and political) shape tourism activities.

Accessibility

Use of geo-spatial tools analyzing the effects of global change on tourism.

Global change

Thank you

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