

Spatial Data Mining and Three Dimensional Visual Perceptions of Product Variety and Retail Rents on Central Urban Shopping Areas: results from Ximending District of Taipei City*

TONY SHUN-TE YUO

ASSOCIATE PROFESSOR

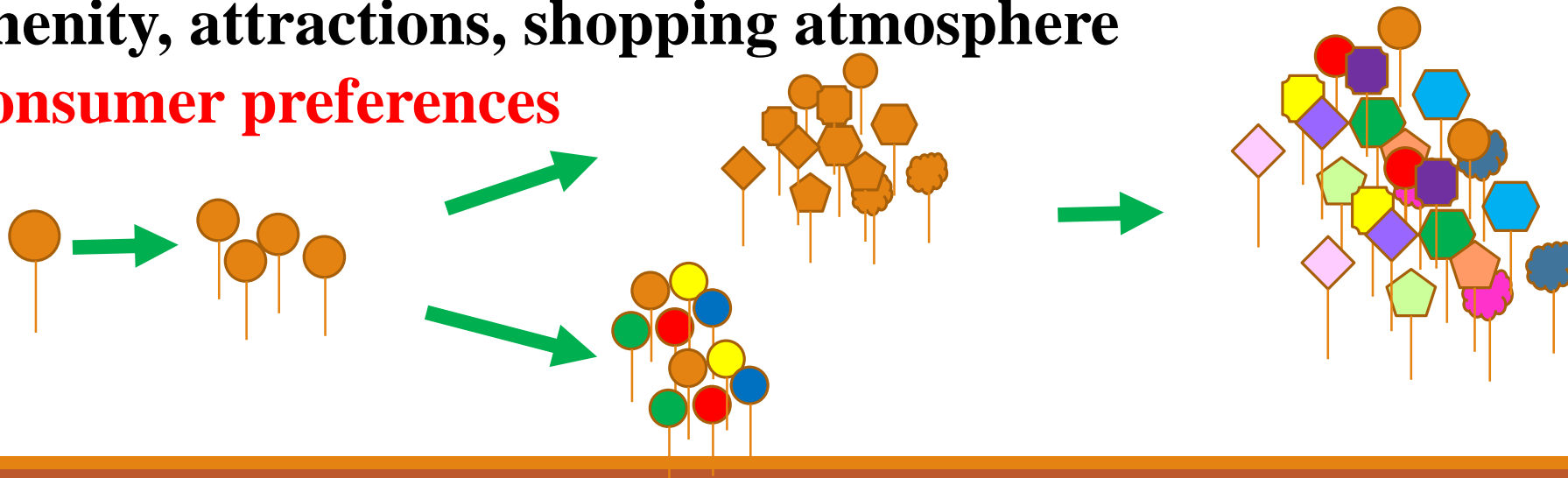
DEPARTMENT OF REAL ESTATE AND BUILT ENVIRONMENT

NATIONAL TAIPEI UNIVERSITY

*This research is funded by the Ministry of Science and Technology of Taiwan, ROC. MOST: 104-2119-M-305 -001 -

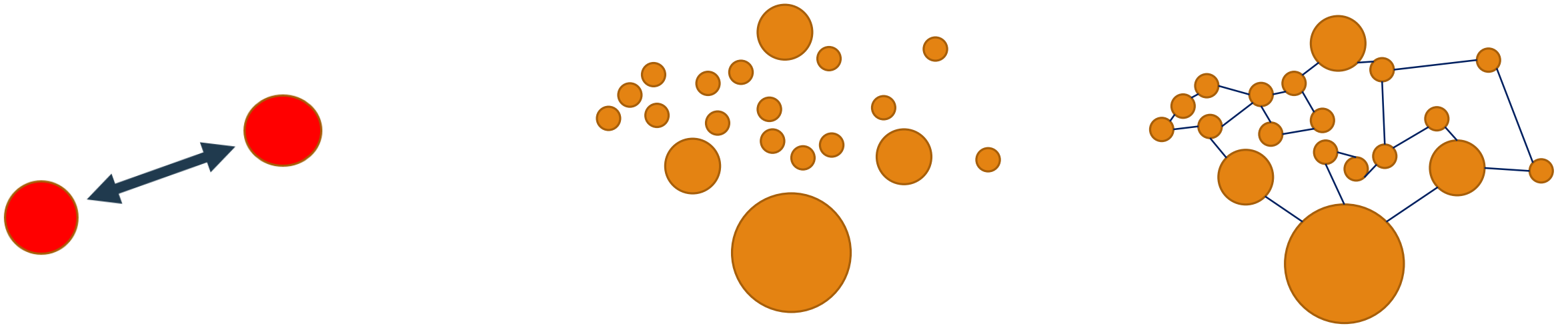
I. Introduction: product variety and agglomeration economies

- **Product variety** or diversity has been one of the main stream research concerns in spatial agglomeration economics
- Retail agglomeration economies is a crucial source of spatial **productivity** and **positive environmental atmosphere**: retail amenity, attractions, shopping atmosphere
- **Consumer preferences**



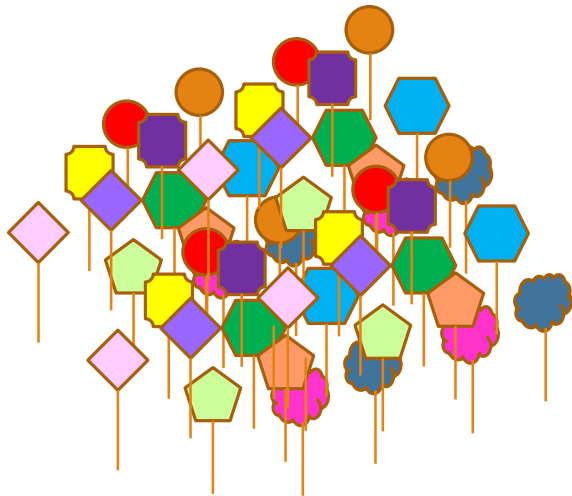
I. Introduction: gravity and spatial pattern

- **Sources of gravity: customer drawing power of a shopping area**
- **Pedestrian flow/ Shoppers' circulation: spatial patterns of a shopping area**



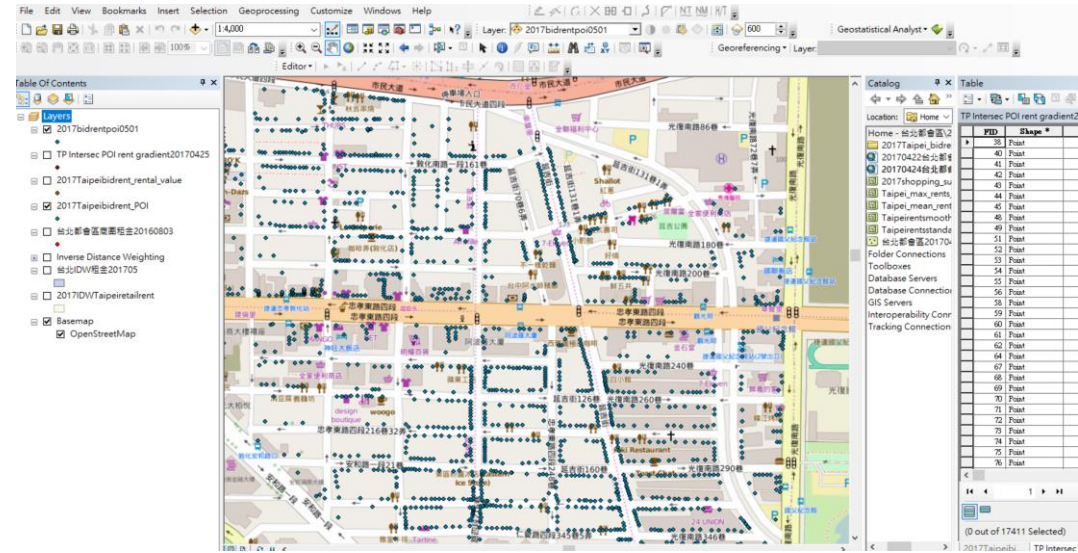
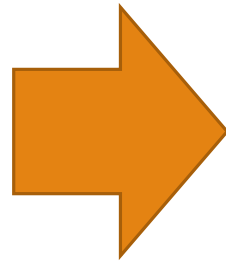
Introduction: visualization of data

- **All of the above influential spatial/nonspatial features of product variety within urban or spatial environment are **intangible****



- **Features of product variety?**
- **Spatial patterns?**

II: Research Design and data: Retail shopping area (POI Survey)

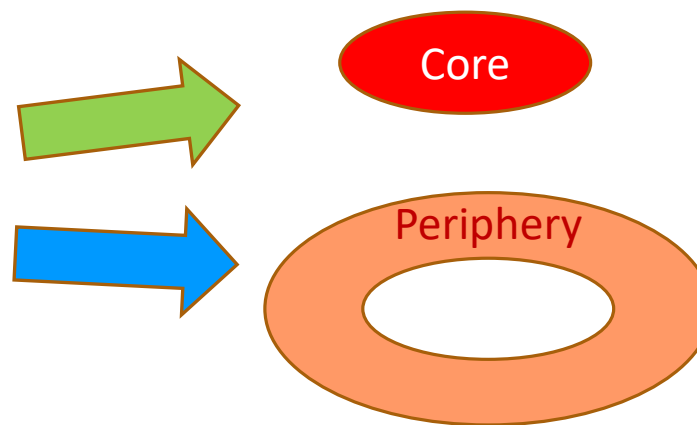


II. Research Design and data

- Data mining:
 - ◆ Principal Component Analysis/Factor Analysis
 - ◆ Regression
 - ◆ Clustering

L1 Restaurants, café and foods	L13 Sports, gym, cycling
L2 Apparel and accessories	L14 Convenience stores
L3 Beauty, hair and cosmetics	L15 Cinemas
L4 Electronic Appliances, computers and mobiles	L16 Hotels and B&B
L5 After-school education	L17 Hobbies, design, toys, games
L6 Hospital and clinics and dental	L18 Optical
L7 Jewelry and watches	L19 Department stores and shopping centers
L8 Night Club, KTV, special entertainments	L20 Automobile and motorcycle
L9 Banks, insurance and securities	L21 Supermarket and freshfoods
L10 Footwear	L22 Lotteries pawn shop tobacco and betel nuts
L11 Homewares, florists and living goods	L23 Religious
L12 Services	L24 Public facilities

PCA/FA



Regression

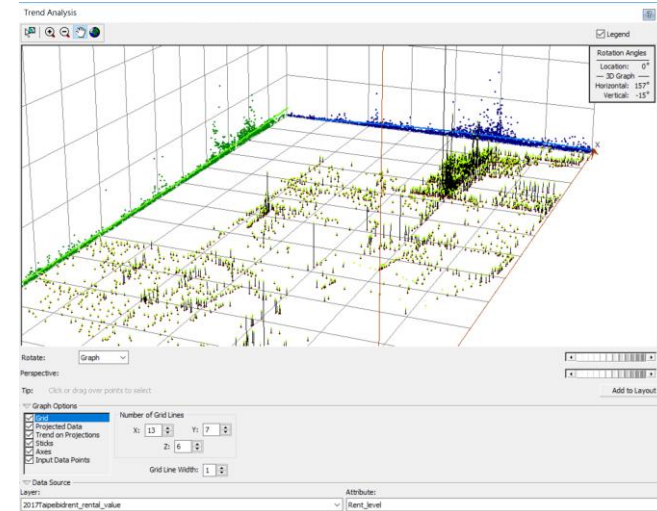
Performance/
Rents

Clustering

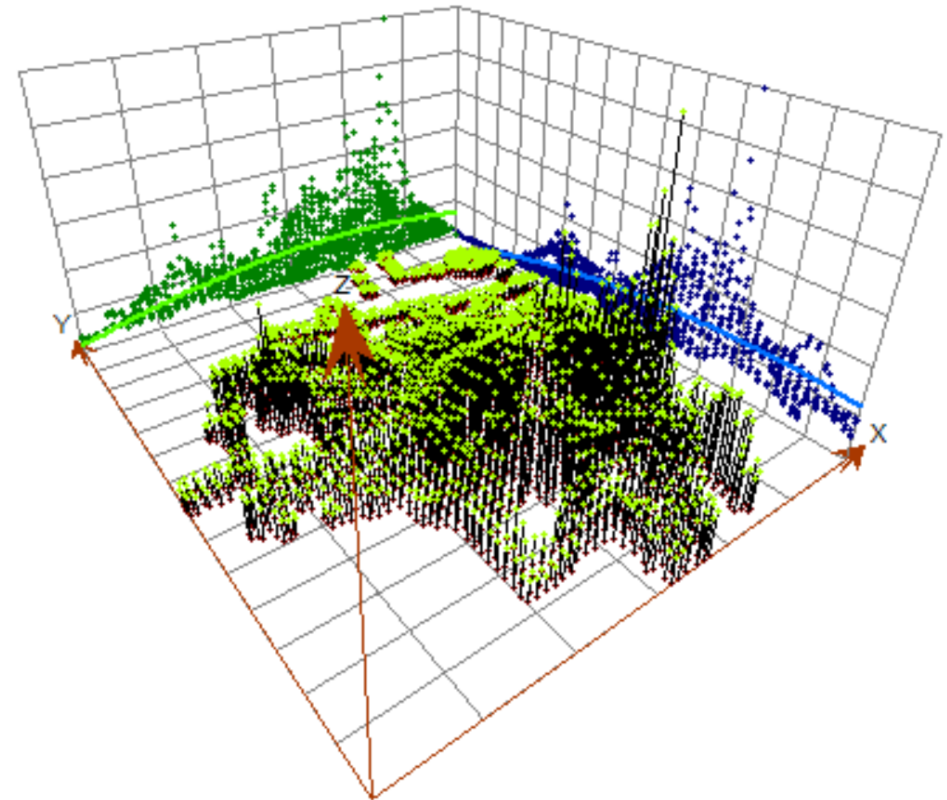
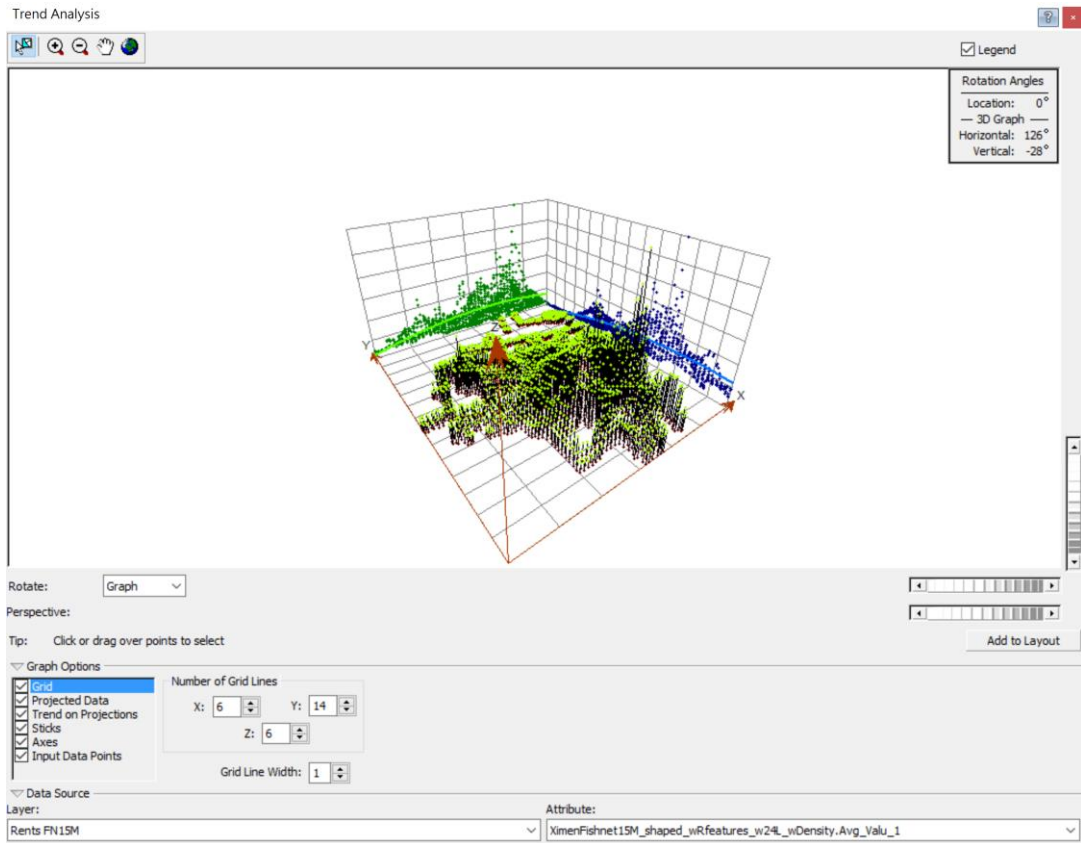


II. Research Design and data

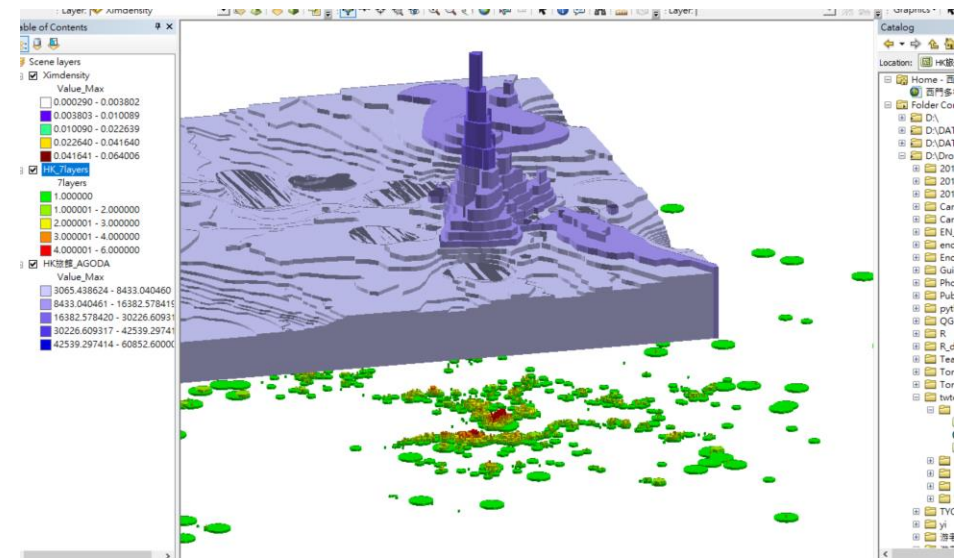
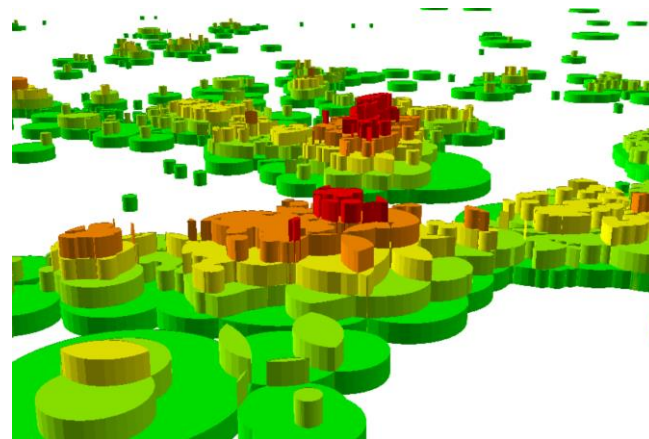
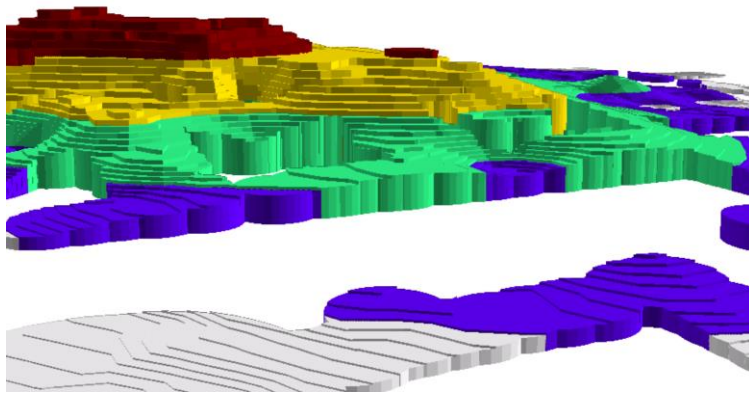
- Geostatistical analyst:
 - ◆ Exploring data: trend analysis
 - ◆ Inverse distance weighting (IDW)
 - ◆ Kriging/CoKriging



III.Results: store density distribution



III. Results: Visualization of intangible features



IV. Conclusions

1. The effects of the features of product variety to retail rents
2. Agglomeration economies: store density to retail rents
3. Negative effects
4. Pedestrian effects
5. Visualization of the intangible features