

*Assessing Tourism Destination Image and Spatial Pattern
Using Opinion Mining Analysis*

Chiung-Hsu Liu, Department of Geography, Chinese Cultural University, Taiwan

Meng-Lung Lin, Department of Tourism, Aletheia University, Taiwan

Chien-Min Chu, Department of Geography, Chinese Cultural University, Taiwan

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Abstract

Footprints of tourism activities from tourists are significantly increased in social medias with its maturity in recent years. More tourists use the platform of social media to present their travel records. Thus, the content of travel records include tourists' mood during journey, comments of scenic spots visited, spatio-temporal information and other important information about tourists themselves. The data has accumulated a very large amount of information in the network environment for researchers to assess tourism destination image and spatial tourist pattern in specific tourist destinations. In this study, we used tourists' opinions on the popular social media using opinion mining analysis to explore tourism destination image and spatial pattern of tourist behavior in the Yehliu Geopark in northern Taiwan. The results are helpful for park management to improve tourism marketing and management spatially.

Keywords: Tourism destination image, Spatial pattern, Opinion mining, Geopark.

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1. Introduction

With the maturing of social platform in the internet environment and the wider acceptance of browsing the reputations of travel notes among the people (Serna, Marchiori, Gerrikagoitia, Alzua-Sorzabal, & Cantoni, 2015; Xiang, Schwartz, Gerdes Jr, & Uysal, 2015). The reputation data from tourists has accumulated a very large amount of information in the network environment for researchers to assess tourism destination image and spatial tourist pattern in specific tourist destinations (Choi, Lehto, & Morrison, 2007; Li, Lin, Tsai, & Wang, 2015; Serna et al., 2015; Stepchenkova & Zhan, 2013; Sun, Ryan, & Pan, 2014). More specifically, the user-generated content (UGC) from social platform has become an important source for the public to acquire information of tourism destination. And these information may not be only contains travel records of tourist, because these incidental tourist thoughts and feelings, so researchers could collect tourist evaluation and tourism destination image through opinion mining, and even the spatial information. There are many previous studies have demonstrated the importance of network public opinion to the management practice (Chiu, Chiu, Sung, & Hsieh, 2013; Li et al., 2015). The purpose of this study is to explore and access tourism destination image and spatial pattern through opinion mining analysis to better understand important management issues of tourist behavior.

2. Methodology

2.1 Study area

The Yehliu Geopark with unique geological landscape is an important destination in the north coast of Taiwan. In recent years, the Geopark successfully attracted more than three million tourists in the year 2014. On the other hand, the numbers of tourism reputation of Yehliu Geopark on internet are enough to execute opinion mining analysis. Therefore, we choose Yehliu Geopark to be the study area.

2.2 Data collection

This study adopted opinion mining analysis to explore and access tourism destination image and spatial pattern of tourist activities of Yehliu Geopark. The reputation data of tourists using Chinese language (including both Traditional Chinese and Simplified Chinese) were gathered from tripadvisor.com.tw (Cong, Wu, Morrison, Shu, & Wang, 2014) on August 31, 2015 using an automated Web crawler by R.

2.3 Opinion mining analysis

In order to establish the tourism destination image and spatial pattern of tourist behavior of Yehliu Geopark, this study used the packages of tm, tmcn, Rwordseg with

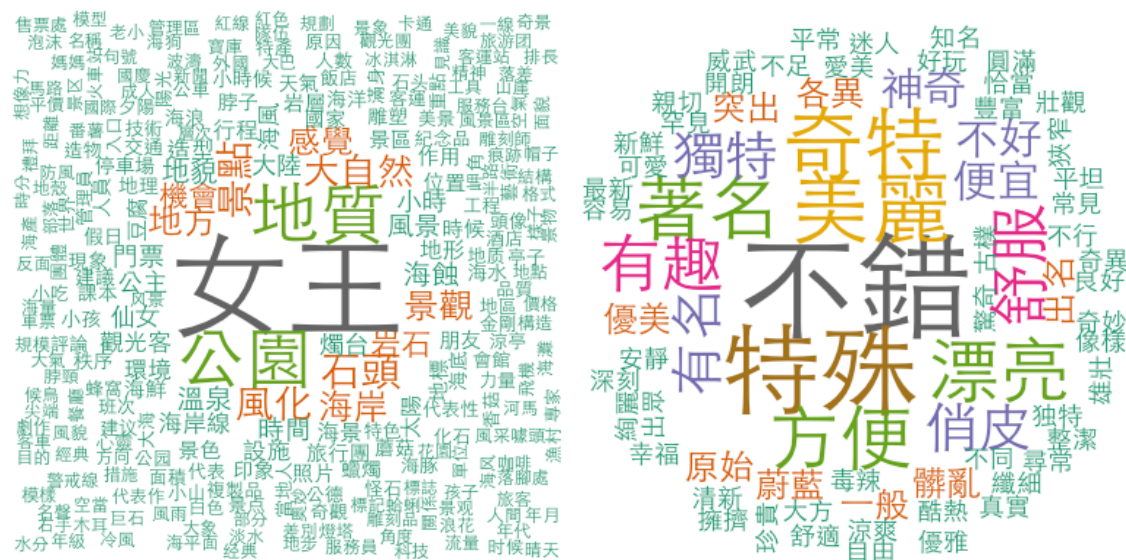
R (Feinerer, 2014; Guan, Yao, Xu, & Zhang, 2014; Junfeng, Jingye, & Zhong, 2014). Thus, the opinion mining is executed through the process of data cleanup, word segmentation and establish corpus. Finally, we used the analytic results of word frequency from Noun (N), Adjective (Adj.), Place name (PN) to achieve the purpose of this study.

3. Data Analysis and Results

The reputation data was gathered from the website of Tripadvisor. 80 verified tourist reputations were selected for opinion mining finally. Then, the results of opinion mining analysis are as follows:

3.1 Tourism destination image

The tourism destination image of Yehliu Geopark is analyzed through opinion mining analysis with N and Adj. in this study. The word clouds of N and Adj. of Yehliu Geopark show in the Figure 1. As the result of opinion mining analysis, the top 10 nouns of word frequency are "Queen", "Geology", "Park", "Stone", "Scenic spots", "Weathering", "Nature", "Place", "Coast", "Landscape". In the result of Adj., the top 10 adjectives include "Good", "Special", "Beautiful", "Strange", "Convenient", "Pretty", "Famous", "Comfortable", "Interesting", "Unique" (Table 1). In summary, the tourism destination image of Yehliu Geopark is mainly composed of positive words in the results of adjectives.



(a) Nouns

(b) Adjectives

Figure 1: The graphs show word clouds of N and Adj. of the Yehliu Geopark

Table 1: The top 10 ranking of N and Adj. of the Yehliu Geopark

Rank	Noun (N.)	Original text	Frequency	Adjective (Adj.)	Original text	Frequency
1	Queen	女王	76	Good	不錯	11
2	Geology	地質	39	Special	特殊	9
3	Park	公園	39	Beautiful	美麗	7
4	Stone	石頭	19	Strange	奇特	7
5	Scenic spots	景點	18	Convenient	方便	6
6	Weathering	風化	17	Pretty	漂亮	6
7	Nature	大自然	16	Famous	著名	6
8	Place	地方	14	Comfortable	舒服	5
9	Coast	海岸	14	Interesting	有趣	5
10	Landscape	景觀	14	Unique	獨特	4

3.2 Spatial pattern of tourist reputations

The results of spatial pattern should be presented using two different spatial scales. Firstly, the result of PN shows the spatial pattern of tourist reputations in the Yehliu Geopark (Table 2). The frequency ranking sequence is Queen's Head (70), Fairy's Shoe (7), Candle Shaped Rock (6), Cute Princess (4), Bean Curd Rock (2) etc. at local scale. The frequency ranking sequence is Yehliu (55), Yehliu Geopark (16), Taiwan (14), North Coast (9), Taipei (5) etc. at regional scale. In the Figure 2 and 3, we attempt to show the spatial patterns of tourist reputations on maps.

In the result, the places with higher frequency not only contain the tourism destinations close to the Yehliu Geopark (such as Yehliu, North Coast, Jishan Old Street...etc.), but also include the tourism destinations far from the Yehliu Geopark (such as Taipei station, National Taiwan University, Taipei City...etc.), even including countries (such as Taiwan, South Korea, China, Japan).

Table 2: The ranking of PN at local and regional scales

Rank	Local Scale			Rank	Regional Scale		
	Place name (P.)	Original text	Frequency		Place name (P.)	Original text	Frequency
1	Queen's Head	女王頭	70	1	Yehliu	野柳	55
2	Fairy's Shoe	仙女鞋	7	2	Yehliu Geopark	野柳地質公園	16
3	Candle Shaped Rock	燭台石	6	3	Taiwan	台灣	14
4	Cute Princess	俏皮公主	4	4	North Coast	北海岸	9
5	Bean Curd Rock	豆腐岩	2	5	Taipei	台北	5
6	Ocean Erosion Pothole	海蝕壺穴	2	6	Keelung	基隆	5
7	Ice Cream Rock	冰淇淋石	1	7	Jishan Old Street	金山老街	3
8	The Statue of Lin Tianzhen	林添禎	1	8	Yehliu Ocean World	野柳海洋世界	3
9	Sea Groove	海蝕溝	1	9	Taipei City	台北市	2
10	Yehliu Lighthouse	野柳燈塔	1	10	Store Street	商店街	2
11	Elephant Rock	象石	1	11	South Korea	韓國	2
				12	Wanli Dist.	萬里區	1
				13	China	中國	1
				14	The Pacific Ocean	太平洋	1
				15	Japan	日本	1
				16	Taipei station	台北車站	1
				17	National Taiwan University	台灣大學	1
				18	Gui Hou	龜吼	1

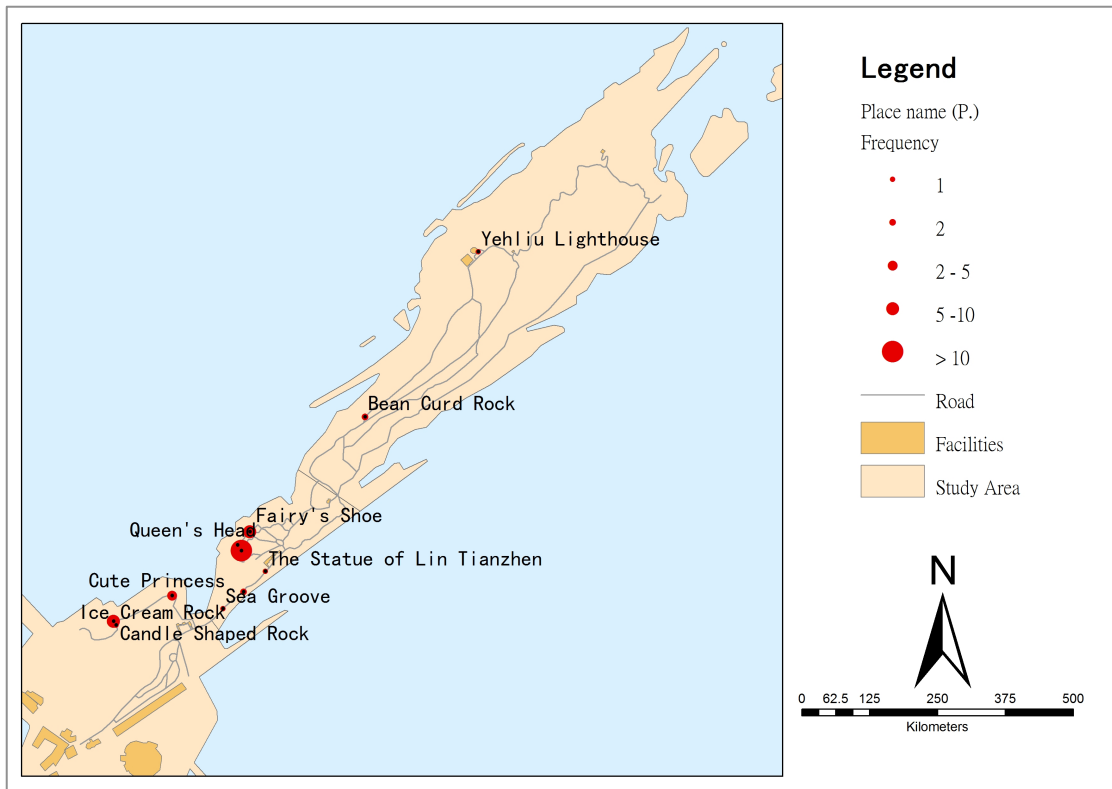


Figure 2: spatial pattern (Inside) of tourist behavior from analysis results of (P.)

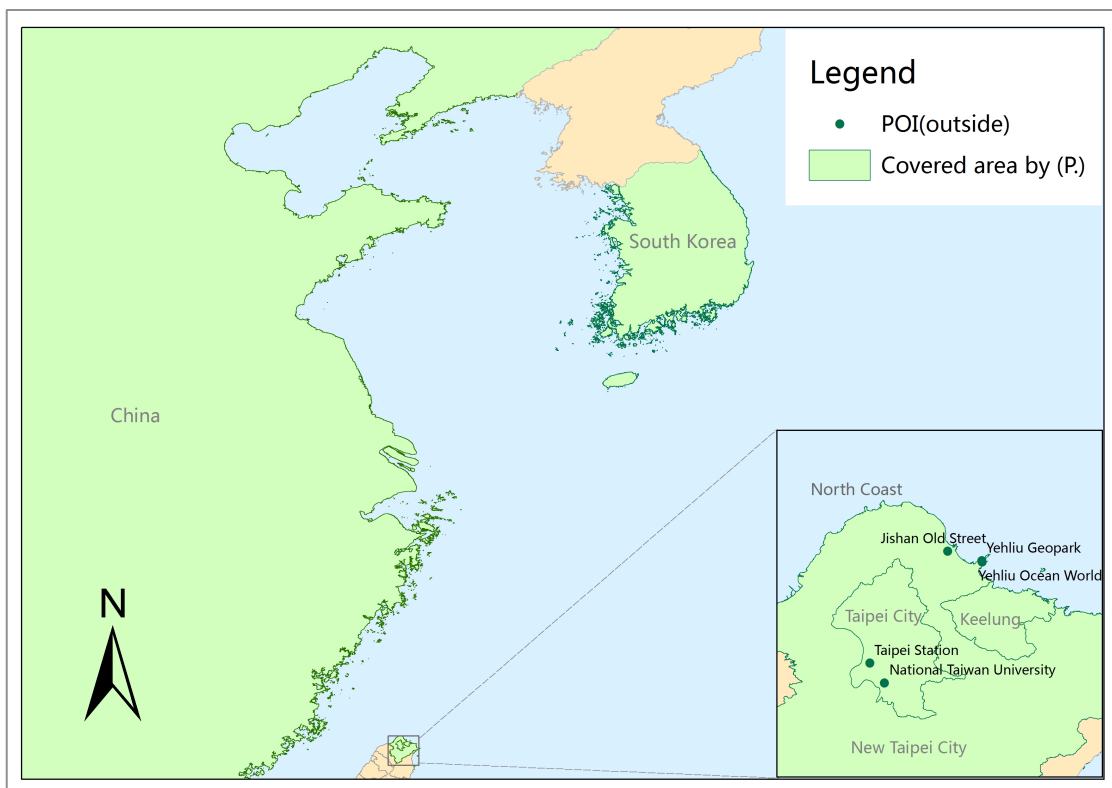


Figure 3: spatial pattern of tourist reputation in the Yehliu Geopark

4. Implications and Conclusion

Social networks become an important information source to acquire insights about tourism destination image. Certainly, the reputation data from social media contains comments, space, and other information is worth for further digging. Then, the information form opinion mining could produce valuable knowledge. To better understand tourist behavior, we attempt to explore and access tourism destination image and spatial pattern of tourist reputations through opinion mining analysis in this study.

Based on the results of opinion mining analysis by N and (Adj.), the top 3 nouns are Queen, Geology and Park. This result shows the actual tourism destination image of the Yehliu Geopark. And the top 3 of Adj. shows positive terms (Good, Special, Beautiful). It is also suggested that the Yehliu Geopark is under good management and operation status. The service quality of the Yehliu Geopark is also well during the study period. We also explore spatial pattern of tourist reputations through opinion mining analysis by PN. The result of PN is useful for tourism planning and management to consider planning and management strategies spatially.

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Contact email: mllin1976@mail.au.edu.tw