How do backpackers plan to travel with a mobile application?

Kota HATTORI and Akihiro TSUKAMOTO

Abstract: Data from social network service (SNS) allow us to reveal users' activities with their comments, photos and videos. Yet they hardly allow us to identify specific population's activities. In the present study, we examined whether it is possible to reveal travelers' specific planning activities using non-SNS data. Specifically, we examined how backpackers searched campgrounds in New Zealand with a mobile application. We created maps with 25km mesh grids and assessed where backpackers searched campgrounds. We also examined whether the users engaged in the search while they were moving or not. The results revealed that backpackers commonly searched campgrounds in major cities and a few major national parks, and that heavy application users tended to looked for campgrounds in stationary manners in some areas.

Keywords: Backpackers, Data Visualization, R

1. Introduction

Travelers can share their thoughts and feelings from anywhere they are visiting using social network services (SNS). They can even share what they see uploading pictures and videos on SNS. In this sense, we can easily see travelers' experiences. Yet, we cannot see some other activities of travelers with SNS. For example, one cannot easily examine how they set up their trip plans. One cannot easily examine what specific types of travelers (e.g., package tourists, hitchhikers, and backpackers) are doing in their trips.

We, therefore, have been utilizing other information resources and investigating some activities of these types of travelers. For example, Hattori and Tsukamoto (2015) examined where hitchhikers get rides using big data from Hitchwiki (http://hitchwiki.org). The results revealed that hitchhikers get more rides in France, Germany and the Netherlands; hitchhiking is popular in these countries. The results also revealed that hitchhikers get rides nationwide in the Netherlands, and that they mostly get rides in big cities in France and Germany. In the present study, we further examined travelers' activities using non-SNS big data. Specifically, we examined where and how backpackers searched campgrounds with a mobile application.

2. Data

We utilized big data by GeoZone in New Zealand, which was collected with a mobile application. The entire data consists of approximately 22,230,000 data points including user ID, searched items, used language, geocode, and timestamp. We extracted data for campground search in this study, leaving approximately 16,197,000 data points by 35,921 users.

Kota HATTORI
Tokushima University,
Faculty of Integrated Arts and Sciences,
1-1 Minamijosanjima-cho, Tokushima 770-8502, JAPAN
Phone: 088-656-3700
E-mail: kota@tokushima-u.ac.jp

3. Analysis

We aggregated the data and identified how many times each user looked for campgrounds. Then, we classified the users into four groups with natural breaks: low users (2-336 times, n = 29,073), mid users (337-1,138 times, n = 5,544), high users (1,139-3,319, n = 1,232), and super users (3,320 – 17,736 times, n = 62).

First, we examined whether there is any difference in how these groups searched campgrounds. We expected that fanatic backpackers (e.g., super users) would stay out of big cities more and searched campgrounds. Figure 1 displays where backpackers searched campgrounds. Common popular search points generally stay in major cities (e.g., Queenstown, Christchurch, Nelson, and Auckland) and some popular tourist destinations (e.g., Kaikoura, and Rotorua) across the groups. This suggests that fanatic backpackers visit big cities. Common popular search areas also stay in West Coast, where two big national parks (Mount Aspiring National Park, and Aoraki/Mont Cook National Park) exist, suggesting that these parks are popular destinations among backpackers. On the other hand, there is a difference among the groups. In the figure, more areas are not covered with mesh grids for super users, compared to other groups, indicating that the users did not search campgrounds in the areas. This suggests that the users had some specific ideas about their traveling.

While we can recognize where backpackers searched campgrounds, we do not know how they did so from the previous analysis. That is, we do not know whether they searched campgrounds while they were in moving or stationary manners. We, therefore, calculated distance between data points for all users. We considered that distance larger than 5 meters between any two data points indicate application users were moving while they searched campgrounds. For low users, there were 3,265,263 moving data points and 1,340,624 stationary data points, leaving 4,605,981 data points in total. About 71% of the data points were moving. For mid users, there were 4,804,289 moving data points and 1,940,367 stationary data points, leaving 6,744,749 data points in total. About 71% of the data points were moving. For high users, there were 2,942,075 moving data points and 1,162,001 stationary data points, leaving 4,104,188 data points in total. About 71% of the data points were moving. For super user group, there were 472,488 moving data points and 269,449 stationary data points, leaving 742,134 in total. About 64% of the data points were moving.

In order to see how moving and stationary data points are distributed, we further calculated the proportion of moving data points for each 25-km mesh grid. Maps on the right side of Figure 1 display the proportion of the moving data points. Overall, backpackers were searching campgrounds in many areas while they were moving. Particularly, there were more mesh areas with red and orange colors among low users and mid users, suggesting that they searched campground more while they were moving. On the other hand, there were more mesh areas with green and blue colors among high and, particularly, super users, suggesting that they searched campgrounds while they stayed in same places. For example, the super users stayed and searched campgrounds in Milford Sound, which is on the west side of Queenstown, and Pureora Forest Park, which is on the southwest side of Rotorua.

4. Discussion and conclusion

The present study investigated how backpackers

searched campgrounds with a mobile application, and whether they searched the facilities while they were moving. Regardless of whether they heavily used the application or not, backpackers were prone to search campgrounds in major cities and national parks in West Coast, Backpackers who heavily used the application were prone to search campgrounds in stationary manners more in some areas (e.g., national parks and forest parks) compared to less frequent users. For further analysis, the data need to be processed with more criteria to define moving data points. In this study, we simply calculated distance between data points and determined whether users were moving. We should consider time interval and extreme distance between data points. Once we have these criteria and define moving data points, we would be able to reveal backpackers' activities with more accuracy.

Reference

Hattori, K., & Tsukamoto, A. (2015) Where are good hitchhiking points? – Data analysis and visualization of Hitchwiki, *The 25th Meeting of Geographical Information System Association of Japan*, Tokyo, October 2015.

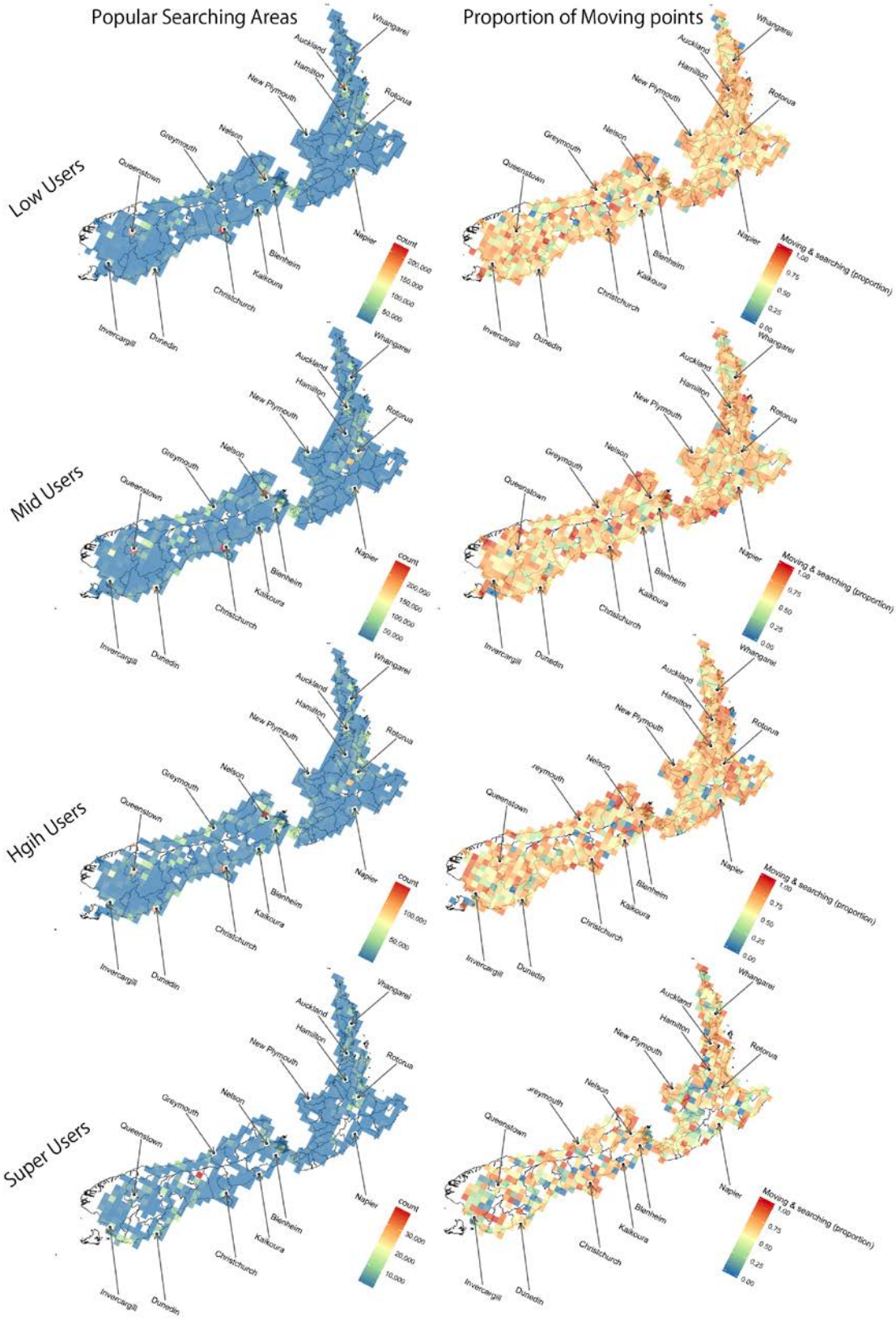

Figure1. Four maps on the left side show where backpackers searched campgrounds. Each mesh represents 25 square kilometers. Four maps on the right side show proportion of data points which backpackers searched campgrounds in moving manners.