Analysis of tourist behavior and interest based on country of residence using photos and metadata: With a focus on Kyoto City Area

Tomoka Togiya[1], Yusuke Kimura[2], Tetsuharu Oba[1], Junichi Susaki[1]*

[1] *Kyoto University*

[2] *Osaka Institute of Technology*

Congestion at popular sightseeing spots is a persistent issue predating the COVID-19 pandemic. With the recent deregulation of the tourist industry, the number of tourists, especially, from foreign countries is rising, and congestion is once again becoming a problem in sightseeing spots. Understanding tourist behavior is essential for alleviating this problem. Meanwhile, with the spread of smartphones with high-dimension cameras and the prevalence of social media, tourists now casually take photos at sightseeing spots and frequently upload them online. The objects in the shared photos enable us to understand what the tourists were interested in when they took the photos. In addition, these photos contain metadata, EXIF (Exchangeable Image File Format), which provides information, such as location, shooting date and time, camera type, and settings. By leveraging the subjects and location data, we can analyze the objects of interest to tourists in sightseeing spots and the places that tourists find attractive.

This study aims to shed light on tourist interests and behavior based on their place of residence using the photos they uploaded on social media and their metadata from around Kyoto City, one of the most popular tourist destinations in Japan. First, we devised a methodology to estimate the country of residence using the location information of the photos taken by tourists. For tourists whose country of residence was estimated to be Japan, shooting time was used to classify them into two groups: those living around Kyoto City and those visiting from far away. Using the results of these residential estimates, three analyses were conducted focusing on the total number of photos taken and the number of tourists who took those photos: (1) Analysis of trends in photo shooting locations based on the place of residence of tourists; (2) Analysis of trends in tourists' interests by country of residence based on the photos; (3) Analysis of trends in the subjects of the photos and the location where the photo was taken. From these three analyses, the characteristics and differences in interest and tourist behavior by place of residence were inferred.

The results of our analyses revealed respective characteristics and trends in the interest shown by tourists and the sightseeing spots they visited in each country of residence. The residents living around Kyoto City showed interests and tourist behaviors that differed significantly from those of tourists. In addition, Japanese tourists showed greater similarity in tourist behaviors and interests with foreign tourists when compared to residents around Kyoto City. Furthermore, differences among foreign tourists depending on their country of residence were found; even if they visited the same sightseeing spot and took photos, they might have different objects of photos and show different interests.

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