

## Landscape Evaluation Method by Visitor-Employed Photography with Usage of Cell-phones - Case Study of Mount Gwanak, Korea

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### 1. Introduction

For spatial planning and designing such as natural parks, it is important to understand how users percept and evaluate landscapes. The relationship between viewpoints and a viewing object has been regarded important in the landscape perception model which has been studied in Landscape architecture, Geography and some sciences. One of the study methods to understand such landscape perception uses a camera called Visitor-Employed Photography (VEP), and this method is considered effective in extracting visual images of a space. However, while existing VEP is effective in understanding viewing objects, it still has shortcomings. It requires interviews and descriptions separately in order to extract viewpoints. Therefore, in order to develop a study method of landscape perception to overcome these limitations, we conducted experiments to get viewpoints by using the GPS function of cellphones which visitors to the sites possess for their daily usage.

### 2. Outline of the experiment

A research was conducted with 60 subjects, and the trail of Mount Gwanak in the suburbs of Seoul, Korea, was selected as a site. This location is designated as Urban Eco-Park. The subjects were instructed to use their own cellphones and take photos of landscapes which subjects evaluate. They were also instructed that Geotag must be attached to the photos. In addition, geographic information of the subject's action was simultaneously collected by GPS logging application of their cellphones. Following this activity, a questionnaire survey about subject's profile was conducted. From the collected photos and spatial characteristics of Mount Gwanak, we analyzed landscape objects which are appreciated by the visitors.

### 3. Results

1,119 photos were collected from 60 respondents. Among these, the redundant photos of the same composition taken by the same subject (121 photos) were eliminated. In addition, geographic information were not available from 6 subjects, hence theirs (99 photos) were also eliminated. Further eliminated were the other photos with geographic information errors (45 photos), and the remaining 842 photos were used for analysis. These photos were categorized based on the viewing objects and viewing distance. As a result, based on the trail as a viewpoint, the photos of landscapes within the woods counted most with 120 photos. Panoramic views (105 photos) and closer shots of the space with a river as a main subject were also common. We analyzed the collected geographic information with the Kernel density estimation, and identified the viewpoints of visitor's preference (Fig. 1). This result was combined with the categorized viewing subjects for further analysis, and it was found that photo shooting density tends to be high at the following locations: 1) panoramic view, and the rock and the building at the mountain top in the surrounding area of the mountain top (Fig. 1.1), 2) the touching points of the trail and the river (Fig. 1.2 and 1.3), and 3) locations with a temple (Fig. 1.4)

### 4. Conclusion

In this research, landscapes within the woods, panoramic views, and river views from the trail are highly appreciated at Mount Gwanak. While panoramic views and river landscapes were concentrated in certain locations, there was no spatial tendency detected with the landscapes within the woods. From the questionnaire survey, 42 respondents (70%) responded comfortable. Eighteen (30%) responded not comfortable; and among those, two (3.3%) were about GPS and others were about the course. Thus, the load of study method itself can be considered light. As described above, this study method can be useful as a future development of a landscape perception research method. It enables visual extraction of viewpoints and viewing objects as shown in this research. Furthermore, this method can be applicable to international comparative studies to identify cultural differences in landscape recognition.

Keywords: landscape evaluation, GPS, GIS, Visitor Employed Photography

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