Time Mapping: A GIS Field Survey Technique

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Fieldwork Participants (Main Entrance of the University of Tsukuba).

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1. Introduction

Time Mapping framework provides a hassle free platform to collect geographic information from any geographical space while you are in motion. A low cost light weight GPS with the capabilities of recording geographic coordinates and time and a normal digital camera are required. In this framework, the GPS can be mounted in usual cap, top of the backpack, bicycle or car. GPS needs to calibrate time interval and the start point. Date and time in Camera should be synchronized to GPS. After calibration the GPS and Camera, investigators can start their observations plan and capture photos of any point of interest freely. This type of survey is easy, rapid, and cost effective and able to collect very important spatially referenced data. The collected data can be used for many practical applications such as land use inventory development, keeping travel log, analyzing tourists' behavior, and sharing field observations experience to other colleagues over internet.

2. Field work objective

As an application of time-mapping, we aim to investigate Japanese urban structure, characteristic of urban village, and landscape design in Sakura area of Tsukuba Science City.

3. Method

Figure 1 shows model route of a typical observation plan. Participants were divided into two groups (A and B). Two GPS (Model: i-gotU, GT-120), one for each group, were fully charged and calibrated with local Tokyo time. Digital cameras were also synchronized with GPS date and time. In this field work, date and time synchronization between the GPS and Camera is very important. During the field survey, some interesting sites, for example, university headquarter, planted trees along the road, rice field, restaurants, super markets, apartment renting system, traditional and modern Japanese style houses, farmers house, kitchen-garden, social linkage between residents, etc. were elaborated to the participants. The participants were encouraged to take photos as many as they considered important for the observations.

After completing the field survey, all the participants were returned to SIS Lab for processing the collected data. @trip PC software was used which is specialized to auto-add GPS information on the photos taken during the survey and present the results lively on 3D map. The software also allows customization and export GPS information in various file formats, in order to share surveyed information with other colleague.

Figure 1. Model Route: Sakura Area, Tsukuba.
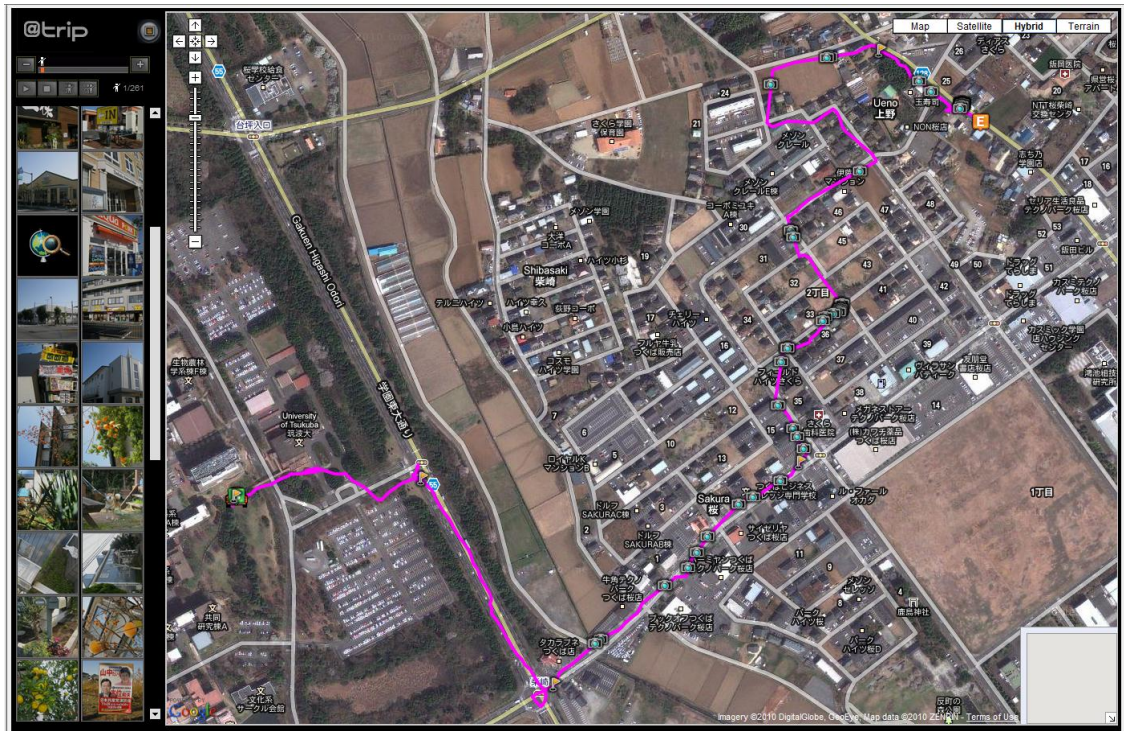
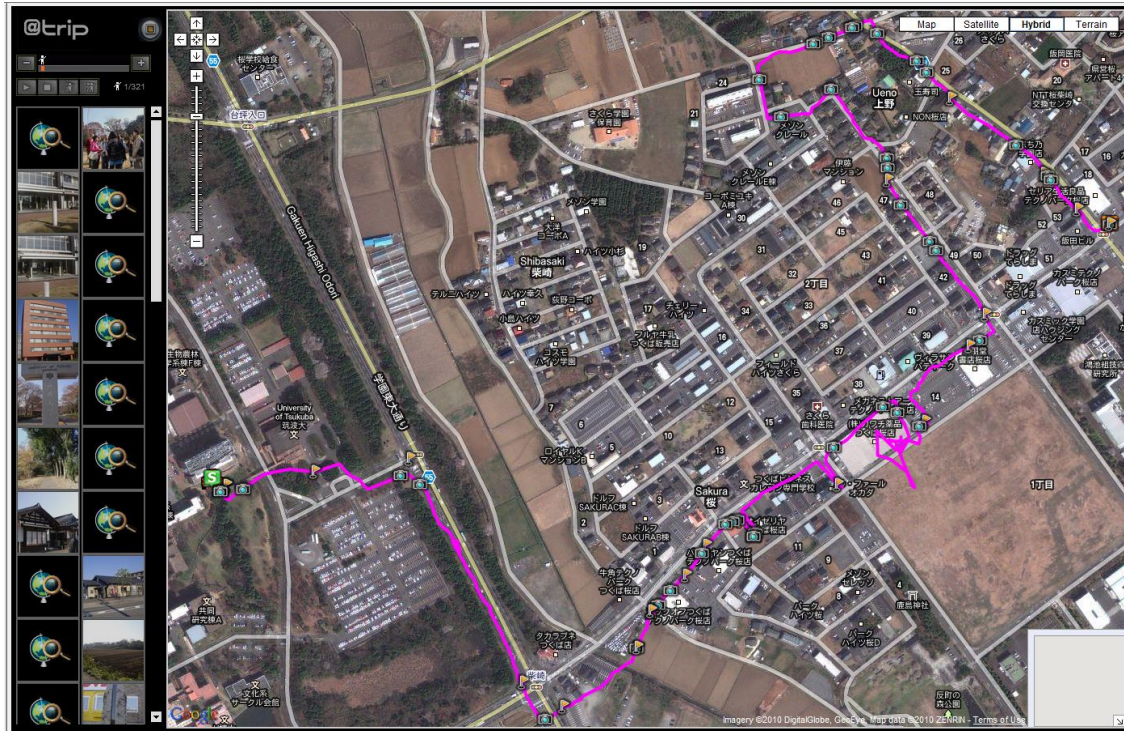# 4. Results

Figure 2. Survey results by Group A

Figure 3. Survey results by Group B

The results from both Groups were shared over internet. As of 30 November 2010, the internet links for the groups are (A): http://www.a-trip.com/tracks/view/65279 and (B): http://www.a-trip.com/tracks/view/65281. For instance, internet users can observe interesting point by photograph. They can also enjoy watching how surveyors move or follow the path.

Figure 4. Survey result sharing over internet by Group A.

As you can see in the Figure 4, the photograph consists of date, time, and geographic coordinates. The geographic coordinates can be added to a photo based on the recording time. Using the photographic information, land use inventory can be developed. The land use information can be very useful to describe urban structure and characteristics. The movement of an observer and the point of interests as evident by the photographs can be used for spatial behavior analysis which may be very useful for tourism related study.

All the participants were actively participated in the survey. They collected several photographs of many point of interest and actively discussed Japanese urban structure, characteristics of urban village, and the landscape design. Some local residents actively communicated during the fieldwork.

Thank you.