

MASTER'S THESIS

Identifying activity type and trip prupose from data collected by passive GPS

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Identifying Activity Type and Trip Purpose from Data Collected by Passive GPS

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A thesis submitted in partial fulfillment of the requirements

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ABSTRACT

Passive GPS has become a promising method for collecting individuals' activity-travel behavior data due to its limited burden on respondents. However, activity-travel behavior information such as trip, transportation mode and trip purpose are not readily available in passive GPS data and have to be derived from these data. The detection of trip purpose is known as the most challenging issue and the commonly used methods reported in the existing literature can accurately derive no more than 70 percent of the trip purposes.

The purpose of this study is to develop a new method based on genetic algorithm for the detection of trip purpose or activity type. Specifically, a self-learning method based on genetic algorithm is developed. This method establishes a set of classification models through self-learning from data on land use type of trip ends, trip duration and timing, socioeconomic characteristics of respondents etc. To demonstrate and evaluate the validity of this method, a pilot study has been conducted from mid January to late May, 2011. A total of 21 respondents living in Guangzhou, China, were recruited to participate in the pilot study. They were asked to carry a GPS receiver to record their daily space-time trajectories and fill in an activity diary for one or two weeks. The methodology developed in this study is then applied to detect the trip purposes from the GPS data and compare with that reported by the respondents. The results indicate that more than 80% of the trip purposes or activity types (around 859 activities reported by the respondents) can be successfully detected. Both the internal and external validity tests show that the method developed in this study is a reliable method to derive trip purpose from passive GPS data.

This study contributes a methodology to the growing literature on developing GPS-based approaches to collecting activity-travel behavior data.

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