International Journal of Technical Innovation in Modern Engineering & Science (IJTIMES)
Impact Factor: 5.22 (SJIF-2017), e-ISSN: 2455-2585
Volume 4, Issue 08, August-2018

SEMANTIC-GEOGRAPHIC TRAJECTORY DESIGN MINING BASED ON PERSONAL TRAJECTORY DATA

Shilpa B[1], Pooja[2]

[1]*VTU CPGS, Kalaburagi Dept. of Studies in Computer Applications Regional centre kalaburagi, PG Student.*
[2]*VTU CPGS, Kalaburagi Dept. of Studies in Computer Applications Regional centre kalaburagi, PG Student.*

ABSTRACT— Discovering frequent route pattern mining from trajectory data is the basis of location awareness and location services. However, because personal trajectory data is highly uncertain, most existing approaches are only capable of finding short and incomplete route patterns.

In this paper, a novel approach is proposed for the discovery of frequent route patterns based on trajectory abstraction. First, trajectory partition, location extraction, data simplification, and common segment discovery are used to abstract trajectory data, convert these trajectories into common segment temporal sequences (STS) and generate 1-frequent item sets. Then, a pattern mining algorithm is proposed based on the spatial-temporal adjacency relationship.

This algorithm uses the constraint mechanism and bidirectional projected database to mine frequent route patterns from STS. Based on the real Geo Life trajectory data, the experimental results indicate that the proposed method has better performance and can find longer route patterns than other currently available methods.

KEYWORDS— Personal trajectory, data mining, trajectory abstraction, frequent pattern mining , data pre-processing.

I. INTRODUCTION

At present, a high volume of personal daily trajectory data is being recorded because of the popularity of smart mobile terminals. Location-aware computing is primarily concerned with extracting useful information from these trajectory data quickly and accurately to provide personalized location services.

Through the analysis of a large amount of data, Gonzalez et al. found that human trajectories show a high degree of temporal and spatial regularity. Recently, many scholars have been attracted to the identification of frequent route patterns from trajectory data. These route patterns could be useful for personal navigation , destination prediction and recommendation systems, among other uses**.**

II. LITERATURE SURVEY

In [1]M. C. Gonzalez et al Found that human line shows a high quantity chronological and spatial regularity. Recently, Many scholar have been be there to the identification of recurrent path pattern from flight data. These route pattern could be useful for individual direction-finding.these route patterns could beuseful for personal navigation and shows a high degree of temporal and spatial regularity

In [2] L. Chen et al recommendation System among other uses. Trajectory abstraction solves the problem of non-explicit pattern instances, and provides the possibility for pattern mining. In this project, a frequent route pattern mining algorithm based on trajectory abstraction is proposed. First, data is preprocessed to remove outliers. Second, considering the activity characteristics of trajectories, trajectory partition and data simplification are used to compress the original data

In [3]Y. Takeuchi and M.Sugimoto et al finding common route design based individuals path is a Spatial case of sequence design extraction of transaction is self-possessed of a set of items ordered by time. the substance are explicit but for path data, each path is calm collected of a series of co-ordinate numbers. The itema are explicit. But for trajectory data,each trajectory is composed of a series of co-ordinates numbers. Due to the positioning accuracy, the trajectory data are high degree of uncertainity,which means the co-ordinates are collected from the same location do not repeat themselves exactly

In [4]F. Giannotti et al Many methods have been used to quarry recurrent design for different spatio-activist course and individuals personal path data The algorithms are composed of two parts, trajectory abstraction and frequent pattern mining.

III. EXISTING AND PROPOSED SYSTEM

Existing system

Most earlier approaches or methods are able to finds only one route from source to destination means shows the result in only one direction.

The existing algorithms not appropriate to find bidirectional nature of the trajectory. They only search the sequence patterns in single direction.

Proposed system

Proposed system finds more than one possible routes from source to destination and searches for most frequently used routes among them. Proposed system uses bidirectional nature of trajectory data.

A novel method is used for finding the most common used route patterns on the basis of route abstraction. First, routes that are given as input are divide into number of parts after location of those routes are extracted, data are simplified, and common route finding are used to conceptual route data, change these paths into common segment temporal sequences (STS) and generate 1-frequent item sets.

IV. SCOPE AND OBJECTIVE OF A SYSTEM

Objective of the System

The objective of the project is to solve the problem of non-explicit pattern instances, and provides the possibility for pattern mining.

Discovering frequent route patterns among the possible routes from source to destination.

Scope of the system

Large amount of person's individual daily route data is recording to find the common route pattern. Position-aware calculation is basically worried with extracting helpful information from these path data rapidly and exactly to give customized position services. Trajectory concept solves the problem of non-clear design occurrences, and issues the chances for route extraction. have been attracted to the recognition of frequent route patterns from trajectory data.

These route Latterly, many intellect have been attracted to the recognition of common route design from path data these route design helpful for steering, destination forecast instruction methods, amid other uses.

I. METHODOLOGY USED

A. **Trajectory Partition**

The main purpose of trajectory partitioning is to identify the discontinuous points, divide the trajectory into different routes and detect the stop points. A stop point represents a personal destination. It can be taken as the node of a route.

B. **Data Simplification**

Data simplification compresses a mass of redundant trajectory points and extracts the necessary nodes for each route. An improved Douglas-Poker algorithm is employed to simplify route R. As a result, R can be described by the line temporal sequence.

C. **Common Segment Discovery**

Different routes *R* are composed of different lines *L* after simplification. It is not possible to identify route patterns from routes that are described by distinct lines. Therefore, the common segments need to be identified, and then the route *R* is described by common segments.

D. **Data Preparation**

Personal trajectory data was collected from the Geo Life project in Microsoft Research Area. 15 participants' data were selected from Geo Life. Data collection was concentrated in Beijing and lasted for the time periods specified. The data of these 15 participants accounts for 42.3% of the Geo Life data. Compared with other scattered data, the selected data is highly suitable for frequent route pattern mining.

E. **Preprocessing**

Because of the device used and environmental factors, such as poor positioning signals in urban canyons, many outliers in the trajectory data need to be cleaned. Normally, outliers that deviate from continuous trajectory sequences have unreasonable velocity.

VI EXPERIMENATAL RESULTS

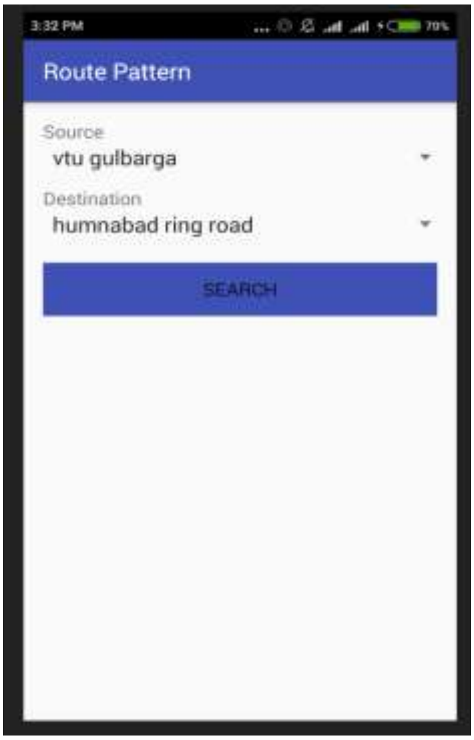

Fig 16 : giving input to find frequent route pattern

When user needs to find frequent route patterns he need to give a source point(from which point he wants to find the frequent route) and destination(to which point).In this figure we are finding frequent route patterns from VTU Gulbarga to Humanabad ring road.

Figure 17: most frequently used route from vtu Gulbarga to humnabad ring road

Figure shows the output of most frequently used route pattern from vtu Gulbarga to humnabad ring road there many routes from vtu to humnabad ring road but this one is the first most frequently used route pattern.

Figure18 : shows second frequently used route pattern from vtu Gulbarga to humnabad ring road.
In Figure these routes are in between points of second most frequently route pattern fro vtu to humanabad ring road.

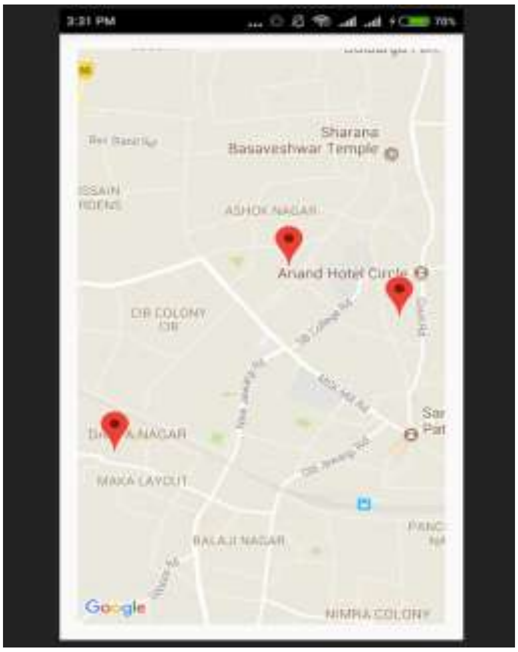

Figure 19 : Output For source VTU Gulbarga and Destination humnabad ring road Circle.

This map shows output of frequently used route pattern there are three routes are used to go from vtu to humanabad ring road there are three routes comes. In the map these locations shows the three routes.

V. Conclusions

Mining frequent route patterns from personal trajectory data is very meaningful for understanding the personal behavior patterns. The priority of route pattern mining is the trajectory abstraction. In this paper, a step-by-step trajectory abstraction algorithm based on the personal activity characteristics is adopted, and extensive experiments were performed to verify the performance of the algorithm. The results demonstrate that the proposed abstraction algorithm has a higher processing efficiency while maintaining the features of personal activities. Meanwhile, the frequent route pattern mining algorithm STAR is proposed. It uses the common segment temporal sequence STSs and 1-frequent item sets which identified by trajectory abstraction, and the bidirectional nature of the trajectory. Experiments have shown that it can find longer and more complete route patterns with the same efficiency level.

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