An Embedding Model for Mining Human Trajectory Data with Image Sharing

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***Abstract* --Location based services are used in positioning enabled devices through Social Media. It is increasing demand in physical world. It gives a many ways to track the record of human mobility, it includes user generated contents and check-in services. Mostly location based social networks have become the digital mirror to human mobility in physical world, which lends an opportunity to understand people's behavior. A multiple status trajectory Embedding Model used to discover contexts in a systematic way which contains user-level, user-trajectory, user-location and temporal contexts. All this contextual Information provides better understanding between different contexts. This is all done for some selected datasets and has employed for trajectory data which has been already gathered in the database. In research area there is a trend on extraction of trajectory data in data mining and it handle demand of trajectory information. Data clustering is one of the best methods to group the same community data. This paper solves the automatic updation of data which is stored in geo-based applications and improves efficiency.**

Keywords: Trajectory Data, Contextual Information, Image sharing.

I. INTRODUCTION

The positioning-enabled mobile devices and location-based social networks provide a range of possibilities to accumulate human mobility such as tweets, photos, instagram. Mainly location based services are becoming the digital mirror to human mobility in physical world, which provides a chance to understand user's behavior. For example, users have different views to understand size, position and temporal action. The Trajectory data follows human mobility, this can be utilized for location-based recommendation applications, and it includes personal location prediction, Group-based Location Recommendation and user Mobility. Previous Studies shows the spatiotemporal data, such as users check in records, and indicates social strength among users, this is utilized for link prediction.

This is a Challenging Task to investigate and mine trajectory information due to the complex characteristics that is reflected in Human Mobility and even for a single record this process is generally related to several Important Factors, it contains users region and categorical choice. From Recent Studies, the tensor factorization model is used that explores various contexts about the users mobility like when, who, what, where. This is the most applicable method to capture the interactions among multiple users, through this surrounding contexts cannot be modeled directly e.g., trajectory information location checked before. The contexts that are considered for trajectory modeling is by sequential data. A kind of sequential data is a trajectory data. One more issue is for new contexts it increases model complexity substantially that is tensor decomposition. To resolve this, a better way to describe multiple kinds of contextual information is needed for modeling trajectory data. To find knowledge of moving patterns, group patterns, location of a specific object services using trajectory of moving objects. Many global positioning systems (GPS) enabled devices are pervasive [1]. Finding movement patterns in trajectory data stream is most helpful in most of the real- time based applications. Because of many reasons the extraction of movement patterns from trajectory data is inevitable. Learning association between moving objects is used to find trajectory data. Different types of patterns in trajectory are projected for literature of trajectories [2].

Trajectory data analysis in case of performance is increasing all over the place and making interest in the real world. By using variety of data mining techniques we can able to make efforts on finding of trajectory patterns. Trajectory of a moving object is like an object in geographical space. The daily actions of a man are recorded in time frame. The man actions produced by day by day exercises, for example, resting, eating, strolling, and running. Trajectory information is the collection of people status, transportation and natural occurrences. The association of trajectories and contextual data is known as semantic trajectories. Based on the type of moving objects, actions, modes of transportation (such as driving, walking, biking, going by flight, going by bus) trajectories are classified. The interesting patterns and features contains individual trajectories and groups of trajectories.

The current work is based on geo-based applications, which specifies temporal, location-level on category of image. This provided information is automatically updated along with the image that is to be share. This process is based on tensor factorization, which makes use of different kinds of perspective that include who (Users), what (Trajectory Data), when (Temporal) and where (Location).

The rest of this paper is arranged in such a way, section 2 describes outline of related work. Section 3 depicts the proposed work, and results are displayed in the section 4, and finally the conclusion of the paper is presented in section 5.

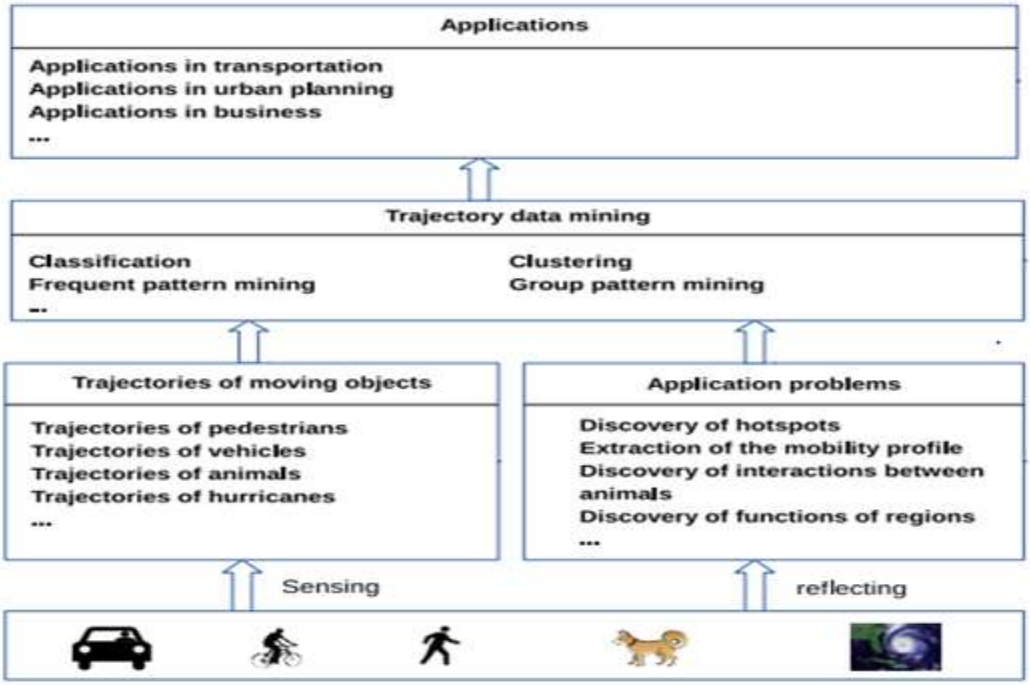

Fig 1: General Framework of Application-driven Trajectory Data mining

II. Related Work

The trajectory data has representative locations are called hot areas or popular areas or selected regions or modified regions. Often visiting locations by the users are called transformed locations and only those locations are represented in trajectory datasets. Users behavior movement can describe based on features that are available in modified locations. A sequence of hot regions is described as transformed trajectory. Using sequential patterns, the movement of user behavior data confine in hot regions. Frequent sequential patterns are mine from sequential patterns and also subsequences of the modified trajectories. A trajectory includes time stamped sample points, which contains a time, latitude and longitude. Line generalization represents a trajectory using a series of linear segments created by joining selected trajectory points. By Ignoring unselected trajectory points the compression was achieved.

XinCao et al. [1] proposed a structure that includes new methods for mining meaningful geographical locations from such information and for the ranking of these locations according to their importance.

Aiden Nibali et al. [3] proposed a new trajectory compression system called Trajic system. Authors also proposed an algorithm, SQUISH, is a one pass trajectory compression algorithm that is based on the line generalization approach of removal data points while reducing the increase in compression error.

Chunyang Ma et al. [4] suggested p-distance technique to measure the difference between two uncertain trajectories based on UTgrid. In terms of query execution time, input and output is more scalable in indexing technique.

Banerjee P et al. [5] proposed InferTra method assumes trajectories from network incomplete observations and instead of route forecasting, the uncertain trajectory provides number of ways and trajectory conclusion.

Christine Parent et al. [6] proposed new views and methods associated to the expansion and scrutiny of semantic trajectories. The first data mining tool kit for semantic trajectories in mining at multilevel is Weka-STPM. There is one more tool called M-ATLAS for semantic trajectories behavior to infer.

AssawerZekri et al. [7] proposed same function and many frameworks with respect to tree structured data, namely Extended Sub-tree (EST). The applications include document clustering, natural language processing, cross browser compatibility, and automatic web testing. When they form an identical sub-tree a group of mapped nodes should have a stronger emphasis on the match of trees. That is, an identical sub-tree represents a similar sub structure between trees, whereas disjoint mapped nodes indicate no similar structure between the two trees .

AssawerZekri et al [7]. proposed a method for ETL process and data warehouse in trajectory and then recommended algorithms to execute trajectory ETL tasks and trajectories.

III. PROPOSED WORK

In proposed work, An Embedding Model for Mining Human Trajectory data with Image Sharing explore the contexts in a systematic way, include human trajectory data. Our model is used to distinguish several types of perspectives for different applications using trajectory data. Embedding space is allocated for related information and it is suitable to examine the relation among different contexts. This proposed model is applied to location recommendation and prediction of social link. The main objective is to characterize multiple kinds of contextual information for trajectory data.

All the contextual information is represented in the same embedding space, which makes it convenient to analyze the association among different contexts. We apply the proposed general model to two challenging tasks, namely location recommendation , which specifies temporal, location-level on category of image.

This data is automatically updated along with the image that is to be share. Tensor Factorization, use of different kinds of perspective that include who (Users), what (Trajectory Data), when (Temporal) and where (Location). Tensor factorization and decomposition has become an main tool for data mining. A few tensorial structured data is analysed in large-scale by researchers.

Spatial, Temporal or spatio-temporal arrangement in individual trajectories and in between categories are analyzed by methods in mining. And these methods of mining are aim at categorizing the trajectories. Prediction Trajectory pattern mining goal is to discover the movement patterns hidden in trajectories and also to describe them. It gives information about pattern occurrence, and the entities involved in it.

This work involves multi-dimensional suggestions for location, activity and time using tensor factorization on extremely sparse user-generated data. Tensor factorization model includes Contextual information such as user, location, action, time with image that is shared by the users. By using the various dimensions like user, where the user present (location),what user do (action), when (time) these all are on image the matrices are formed. If Users share their images with the time and location other users can benefit with this suggestion those want to visit that place and can participate in the location along with a suitable time. Tensor should represent the user's interest for performing a certain activity at a certain location at a certain time. User-generated image contains name of location, captured time and date this activities occurring when the photograph was taken. Photos are one of the main data sources for the user locations. Different images are uploaded by the users based on their situation. Those pictures are used for multiple purposes such as finding point of interest, location identity of pictures from visual, textual, and temporal features, determining the season of tourism and creates the pleasing to the user.

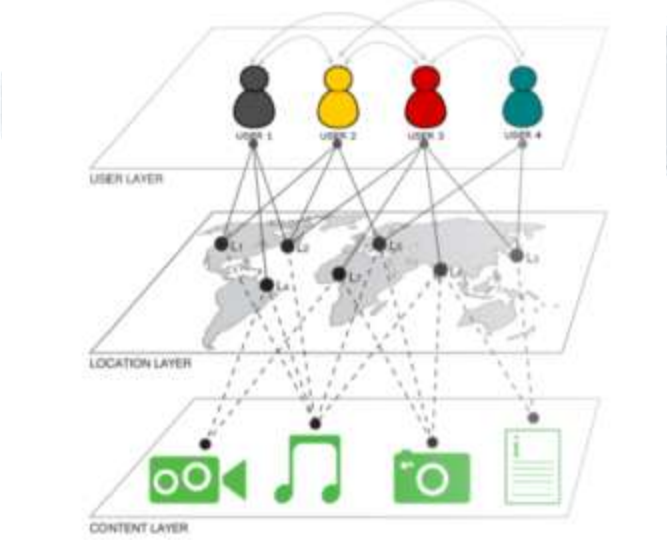

Fig 2: System Architecture

The Fig 1 shows Visual representation of users, location and content that data has shared by the users with in the group.

IV. RESULTS

In this section, User can receives other users information by sharing their details through our application and also maintain relation with other users.

Admin should authorize the users and allow the user to access an account. Admin has to login by using valid User Name and Password. After valid Login, user can perform operations such as view and authorize users, Adding Words and view all user words which are added by user. View Shared Messages and Images.

User should register before performing any operations. Once user registers, their details will be stored at the database. After registration is successful, the required inputs for login are User Name and Password.

View Profile: It shows the user profile and displays the entire details of registered user.

Search Friends, Request, View Friend Request: Friends are searched by the user and can send request to desired persons and that request can be viewed by the person who can received request with sender details.

Create Group: User can create their own group.

Add Members: Members are added in to created groups by the users.

Comments: Comments are given by the friends for the shared images that are sending by the friends in the list.

Send Image: Images can send by the user to friends in a group and that image specifies the trajectory information such as location, time and date. This is shown in following images.

Fig 3: Select Friends Group

Fig 4: Send Images to users

Fig 5: Shared Image information

V. CONCLUSION

To better understand the people behavior, location based social networks have become the reflection of human mobility in physical world. Trajectory Embedding Model used to discover contexts in a systematic way which contains user's present status, trajectory, location and temporal contexts.

All the contextual information is represented in the same embedding space, which makes it convenient and better understand to analyze the relationship between contexts in different ways. This is all done for some selected datasets and has employed for trajectory data which has been already gathered in the database. Along with this, the trajectory data of selected image is generated.

Temporal, Location-Level on category of image with automatic update of information are shown in our application. It improves efficiency of previous method. Our future work will be on customizing algorithms implementing some of the presented methods to perform a context-aware mining of trajectory data for selected application problems.

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