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Discovering Application Level Semantics for Online Discovery of Gathering Patterns

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Abstract: This system evaluates Traditional works focus on finding the movement patterns of each single object or all objects. This paper propose an efficient distributed mining algorithm to jointly identify a group of moving objects and discover their movement patterns in Wireless Sensor Networks (WSN). The algorithm consists of a local mining phase and a cluster Ensembling phase. The local mining phase adopts the Variable Length Markov (VMM) model together with Probabilistic Suffix Tree (PST) to find the moving patterns, as well as Highly Connected Component (HCC) to partition the moving objects. The cluster Ensembling phase utilizes Jaccard Similarity Coefficient and Normalized Mutual Information to combine and improve the local grouping results. In this paper we draw on a large body of literature in movement ecology, a branch of behavioural ecology, where the study of the spatio-temporal footprint of behaviours has a long tradition. For decades, this community has developed techniques for meticulously capturing the behaviour of animals, acting and interacting in and with their habitats. Often, such research features detailed descriptions of the geometric and topological arrangements of actors and the temporal sequences of the actions, all of which crucial building blocks shaping behaviours. In the context of a complete game design, the shape and population of this space can have a dramatic impact on game play experiences. A generative procedure may fail by producing an undesirable arty fact such as an unsolvable puzzle, a nonsensical story, or, worse, level data or mechanical logic that crashes a game engine. Design concerns, such as avoiding pathological failures, dictate constraints on the design space of a generator, some of which may be very difficult to resolve without an extensive redesign of the generative procedure based on trajectory data both from agent-based simulation and real observation data emerging from an outdoor game for children.

Key words: clustering, compression, hybrid, patterns, semantics, Movement pattern mining, trajectory data, reaction patterns, spatial Collective.

I. INTRODUCTION

In object tracking applications, many natural phenomena show that objects often exhibit some degree of regularity in their movements. Biologists also have found many creatures, such as elephant, zebra, whales, and birds, form large social groups when migrating to find food, or for breeding or wintering. These characteristics indicate that the trajectory data of multiple objects may be correlated for biological applications. This raises a new challenge of finding moving animals belonging to the same group and identifying their aggregated group movement patterns. Therefore, under the assumption that objects with similar movement patterns are regarded as a group, and define the moving object clustering problem as given the movement trajectories of objects, partitioning the objects into non-overlapped groups such that the number of groups is minimized. Group movement pattern discovery is to find the most representative movement patterns regarding each group of objects, which are further utilized to compress location data. Movement patterns structure large trajectory data sets and allow a better understanding of the dynamics amongst moving objects. This paper proposes patterns that model the reaction behavior between two individuals of different types of moving objects, as in predator prey or female-male behavior patterns. Inspired by

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behavioral ecology, reaction movement patterns for pursuit and escape, avoidance, and confrontation are conceptualized, formalized, and algorithmically detected. The approach is evaluated through a set of numerical experiments with simulated and observed trajectory data. Movement patterns detect structure in large trajectory data sets and thereby help understanding the involved processes. With rapidly growing repositories of fine-grained trajectory data. Capturing the movement of animals, pedestrians, or motorists, Geographical Information Science has seen a growing interest in movement pattern analysis. The pattern flock, where a certain number of objects move together for a specified time period, is a prominent example. [12][5].

II. Related Work

The energy consumption can be reduced in large-scale sensor networks which systematically sample a spatio-temporal field. A distributed compression problem is subject to aggregation costs to a single sink. This shows that the optimal solution is greedy and based on ordering sensors according to their aggregation costs. A simplified hierarchical model for a sensor network including multiple sinks, compressors/aggregation nodes and sensors. This addresses arrangement of distributed compression subject to aggregation costs to a single sink and hierarchical architectures for aggregation /compression in large-scale sensor networks including multiple sinks. Ontological ramifications for representing collective phenomena, and therefore present a range of appropriate classification phenomena. One of these criteria is the differentiation of roles. For interaction patterns roles are key. Finally, Orellana et al. present one of the few studies explicitly focusing on interaction movement patterns. In their study the authors investigate approximation, attraction, and what they call suspension (stops) based on flows and density maps.

The aim is to minimize overall aggregation costs, associated with gathering sensor information. This maximizes the network lifetime. An optimal hierarchical organization of sensors, aggregation points/compressors, and sinks can be used to minimize the cost of gathering sensor data. Aiming to overcome the above deficiencies, we have developed an effective mobility prediction algorithm. In the first phase of this three-phase algorithm, movement data of mobile users is mined for discovering regularities in inter-cell movements. These regularities are called mobility patterns.

III. Problem Description

The problem is formulated as exploring the group movement patterns to compress the location sequences of a group of moving objects for transmission efficiency. Consider a set of moving objects O = {o1, o2... on} and their associated location sequence dataset S = {S1, S2… Sn}. The coverage area consists of a number of location areas. Each location area may consist of one or more cells but in our work we assume that each location area consists of only one cell. Base stations regularly broadcast the ID of the cell in which they are located. [11][8][8]Therefore, the mobile users which are currently in this cell and listening to the broadcast channel will know in which cell they are now. The movement of a mobile user from his current cell to another cell will be recorded in a database which is called home location register (HLR). In addition, every base station keeps a database in which the profiles of the users located in this cell are recorded. This database is called visitor location register (VLR). Therefore, in our system it is possible to get the movement history of a mobile user from the logs on its home location register. Object tracking is defined as a task of detecting a moving objects location and reporting the location data to the sink periodically at a time interval. [1][8][9].

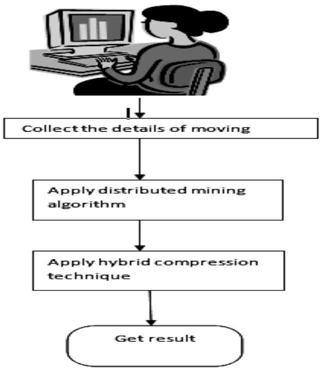

Fig: - 1:-Diagram for Techniques

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IV. Mining Group Movement Patterns

A set of moving objects O together with their associated location sequence data set S and a minimal similarity threshold sim min, the moving object clustering problem is to partition O into non-overlapped groups, denoted by G = {g1, g2, … gi}, such that the number of groups is minimized. This is known as object clustering problem. The moving object clustering problem is tackled by using a distributed mining.[10][4]

V. Cluster Ensembleing Algorithm

Objects scattered in grassland may not be identified as a group. Furthermore, in the case where a group of objects moves across the margin of a sensor cluster, it is difficult to find group relationships. The CE algorithm is proposed to combine multiple local grouping results. The algorithm solves the inconsistency problem and improves the grouping quality. To combine multiple local grouping results into a consensus, the CE algorithm utilizes the Jaccard similarity coefficient to measure the similarity between a pair of objects, and NMI to derive the final Ensembling result. This trades off the grouping quality against the computation cost by adjusting a partition parameter. The Ensembling problem involves finding the partition of all moving objects O that contains the most information about the local grouping results. NMI can be used to evaluate the grouping quality.

VI. Algorithmic Pattern Detection

The algorithmic framework bases on a straightforward implementation of the criteria listed above. For every time step, spatial arrangements are evaluated and then temporal persistence and Sequence of the given criteria is computed. Even though the development of efficient algorithms was not a goal of this study, most solutions base on pair wise comparisons and hence feature a complexity of O (n2t), with n being the number of moving objects and t the number of time steps.[6][9].

VII. Hybrid Compression Problem

Sensor network containing thousands of nodes and these nodes are deployed randomly. Each node will start routing with neighbor nodes after deployment. The sink will generate a query message to all nodes to know the location for nodes. The GPS enabled to allow sensor nodes to get and broadcast their locations. The next process is to implement Voronoi tessellation to divide the field into small shape. Each shape contains different number of nodes. Gateway is used to collect the information from all nodes on its own sub regions then compress the data and sent to sink.[3][11].

VIII. Results

These algorithms are used to locate the objects and their discovered patterns. The GMP mime algorithm can measure the similarity between two objects based on the probabilistic suffix tree. The clustering algorithm uses the Jaccard similarity coefficient and NMI. This improves the grouping quality. The existing algorithms such as FP growth and A priori algorithms still focus on discovering frequent patterns of all objects and may suffer from computing efficiency or memory problems.

IX. Conclusion

These works exploit the characteristics of group movements to discover the information about groups of moving objects in tracking applications. The distributed mining algorithm consists of the GMPMine algorithm and the Cluster Ensembling algorithm to leverage the object moving patterns in grouping objects. With the discovered information, devise the HCT, which have the good ability of approximation to manage the sensor field and have high ability and efficiency. The experimental results show that the proposed compression algorithm effectively reduces the amount of delivered data and enhances compressibility and reduces the amount of energy consumption. The compression algorithm increases the life time of the sensor network. The advantage realized by HCT in resulting in a minimum overall energy consumption reducing energy consumption which contributes better solutions on energy conservation.

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References

1. C. M. Sadler and M. Martonosi, “Data Compression Algorithms for Energy-Constrained Devices in Delay Tolerant Networks,” Proceedings of ACM Conference on Embedded Networked Sensor Systems, Nov. 2006.
2. I. F. Akyldiz, W. Su, Y. Sankarasubermanian, and E. Cayirici, “A Survey on Sensor Networks,” IEEE Communications Magazine, Vol. 40, No. 8, pp. 102–114, August 2002.
3. A. J. Goldsmith and S. B Wicker, “Design Challenges for Energy Constrained Ad hoc Wireless Networks,” IEEE Wireless Communications, Vol. 9, No. 4, 2002.
4. S. S. Pradhan, J. Kusuma, and K. Ramachandran, “Distributed Compression in a Dense Mircosensor Network,” IEEE Signal Processing Magazine, pp. 51–60, March 2002.
5. A. Scaglione and S. D. Servetto, “On the Interdependence of Routing and Data Compression in Multi-hop Sensor Networks,” Proceedings of ACM Mobicom, 2002.
6. J. Chou, D. Petrovic, and K. Ramchandran, “A Distributed and Adaptive Signal Processing Approach to Reducing Energy Consumption in Sensor Networks,” Proceedings of IEEE Infocom, 2003.
7. W. R. Heinzelman, A. Chandrakasan, and H. Balakrishnan, “Energy Efficient Communication Protocol for Wireless Micro Sensor Networks,” in Hawaii International Conference on System Sciences, 2000.
8. I.F. Akyildiz, S.M. Ho, Y.-B. Lin, Movement- based location update and selective paging for PCS networks, IEEE/ACM Trans. Network. 4 (4) (1996) 629–639.
9. R. Agrawal, R. Srikant, Mining sequential patterns, in: Proceedings of the IEEE Conference on Data Engineering (ICDE_95), 1995, pp. 3–14.
10. B. Liang, Z. Haas, Predictive distance-based mobility management for PCS networks, in: Proceedings of the IEEE Conference on Computer and Communications (IEEE INFOCOM_99), 1999, pp. 1377–1384.
11. G.Y. Liu, M.Q. Gerald, A predictive mobility management algorithm for wireless mobile computing and communications, in:Proceedings of the IEEE International Conference on Universal Personal Communications, 1995, pp. 268–272.
12. T. Liu, P. Bahl, I. Chlamtac, Mobility modeling, location tracking, and trajectory prediction in wireless ATM networks, IEEE J. Select. Area Commun. 16 (6) (1998) 922–936.