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To Identify And Analysis The Missing Location In Mobile Network Using Boomerang Protocol

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Abstract:
Generally, the unicast and the multicast routing protocol are used to deliver messages between randomly chosen nodes. The major problem with these type of routing is that they do not process the distributed information's. Several algorithms or protocols such as shortest routing protocol and position based protocol are found to ensure effective routing in sparse network. These techniques focus on delivering the messages to certain nodes. However these techniques or protocols limit the process of retaining the information regarding the missing nodes. The proposed boomerang protocol effectively receives the messages from the nodes at any geographical area. The boomerang protocol attempts to utilize the physical location based information to increase the performance of geo cast delivery. A unique feature of this protocol is that it records the geographical trajectory while moving away from the origin, thus paving a way to exploits the recorded trajectory in case of returning back. This protocol simply attempts to provide more efficient routing method while maintaining the information of the missing node. Boomerang protocol finds a wide application in LAN, WAN, and other mobile communication network.

Key words: *Geo cache, GPS, mobile, location aware information, infrastructure less data management.*

1.Introduction

The mobile computing is using anytime anywhere for the personal sensing or tracking mobile devices such as smart phones, PDAs, and digital cameras start to be used as sensing devices [1]mobile sensing is becoming a social event instead of a high-tech phenomenon. Compared to today's special-purpose sensing applications such as automotive traffic congestion monitoring [4] and pothole detection [5], mobile sensing takes place anytime, anywhere, and will have far more diverse meanings. A direct consequence of this trend is the production of a vast amount of data, in terms of both type and volume. Example data types include pictures, videos, audios, and plain text based sensor readings. These data can potentially bring great convenience to the society as they can serve as traces of our lives and logs of the physical world. Here, Geo caching is an outdoor recreational activity in which the participants use Global positioning system (GPS) receiver or mobile device and other navigational techniques to hide and seek containers, called "geo caches" or "caches", anywhere in the world. Once the Geo cache for an anchor location reaches a certain size, it have the options of compressing the data, or applying the "chaining" technique, which retains only the latest Geo cache entries around the anchor location while saving a link to the storage of older entries. Finally, it may also delete outdated or trivial entries. Boomerang protocol action is similar to boomerang that is the data eventually returns to its origin. Boomerang approach can reduce communication overhead; let us consider a brief thought experiment. One could retain information at the anchor location by simply handing off the Geocache whenever the anchor location moves out of the radio range. Thus, the boomerang approach has the potential to significantly reduce transmission overhead when the Geocache content is only needed periodically. Under more realistic settings, the number of transmissions in the boomerang protocol may be larger because the chosen carrier may diverge at intersections from the original path and not return to the anchor location. It increases the successful return probability of the Geocache even in temporary disconnected scenarios. While the boomerang protocol is inspired by delay-tolerant geographic routing, it is unique in recording a node's trajectory as the node is moving away from the anchor location and using this trajectory as a guidance to carry back the Geocache. Further, to reduce communication overhead, instead of each node sending the Geocache over the wireless link as soon as it was received, we have the node keep the Geocache until it drives off the original trajectory. Thus, it exploits an important character- is tic of vehicular networks, which is: vehicles move on well-defined and usually bidirectional paths. We will show through analysis and simulations how this characteristic impacts the performance. In connected networks, the increased return probability allows significantly reduced communication overhead by purposefully allowing a node to briefly carry the information away from the anchor location before returning it, instead of constantly keeping the Geocache at the anchor location.

2.Problem Statement And Challenges

- Analyze the performance of Geo cache anchoring protocols in terms of return probability using a Manhattan grid topology.
- If the first handoff is not successful (due to low node density, etc.), to allow

Further handoff attempts after a certain time interval.

To simplify the analysis, to make the following assumptions:

The nodes are uniformly distributed on the roadways, grid blocks are of the same unit-size length, the radio range for all nodes are the same, which is also the unit size, so that at any time only one intersection is under the radio range's coverage, in system implementation, if the first handoff is not successful (due to low node density, etc.), then allow further handoff attempts after a certain time interval.

The problem of map matching based on GPS readings has been extensively studied. Some existing work include Even though to share some similarities with the map matching problem when using gps readings to identify road segments, and different significantly with the general map matching problem in the use of road maps. Map matching solutions generally focus on matching a node's position to the nearest street presented in the map. In the process differs fundamentally from current work since here don't use street maps but only GPS readings of traversed paths. Therefore, the general map matching approach which involves searching and comparing nearby road segments could not be applied to problem. Instead, in proposed using absolute distances and heading differences with the recorded road segment to determine divergence.

3.Related Work

3.1.Geo Cache Anchoring Protocols

The goal of the Geo cache anchoring protocols is to retain Geo cache data around the corresponding anchor location while minimizing communication overhead. Intuitively, we envision the following anchoring process, the mobile node that currently carries the Geo cache is moving away from the anchor location. To avoid taking the Geo cache away, it hands off the data to other nodes, preferably those travelling toward the anchor location. After receiving the data, the new carrier node will periodically examine whether another handoff is needed. This process repeats until the data returns to the anchor location, and we call this protocol a boomerang protocol because the data eventually return to its origin like a boomerang.

3.2.Boomerang Protocol

The boomerang protocol is used to find the missing node and send the data. the choice of a new carrier node at each handoff, especially if the first handoff occurs somewhere far away from the anchor location. The data may have traveled along a rather complicated route before the current carrier looks for a new carrier .In this case, a single carrier node may not be sufficient to bring back to the node. instead, nodes B, C, and D all needed to be involved in this returning process. Efficiently choosing a set of suitable carriers is thus the key to the success of the boomerang protocol.

3.3.Trajectory Construction In Revtraj

The primary challenge in implementing the trajectory- based boomerang protocol lies in the construction of the Geo cache trajectory, and the detection of divergence from a given trajectory. Where the Geo cache was handed off to Q who was traveling in the opposite direction of P's trajectory. After traversing the path until B^0 Q diverges from P's trajectory and heads for A^0. In this case, Q must be able to detect the divergence and start extending the path.

Five set of functional steps needed as follows;

- Routing
- Adaptive handoff for in time anchoring
- Boomerang
- Data Preprocessing and Trajectory Recording
- Divergence Detection

3.3.1.Routing

The key component of RevTraj is trajectory recording: the aggregated path the pervious carriers have traveled so far. The trajectory grows when a carrier is moving away from the anchor location and shrinks when it's moving toward the anchor location. Depending on the storage and processing power available on the mobile units, in routing can use either raw GPS traces or "segmented" trajectory which only consists of the critical points on the path.

3.3.2.Adaptive Handoff For In-Time Anchoring

Geo cache is required to return to the anchor location within a specific time interval. A wide range of mobile applications have such requirements. Nodes are mobile equipment and can move freely from one area to another. A group of users with a large range of mobility can access around in the overall network cause high traffic. In these heterogeneous networks, resources are shared among all users and the amount of available resources is determined by traffic load. The traffic load can seriously affect on quality of services for users thus it requires efficient management in order to improve service quality. If traffic load is concentrated in a cell, this cell becomes the hotspot cell. There is a need to have a proper traffic driven handoff management scheme, so that users will automatically move from congested cell to allow the network to dynamically self-balance.

3.3.3.Boomerang

The mobile node that currently carries the Geo cache (referred to as the carrier) is moving away from the anchor location. To avoid taking the Geo cache away, it hands off the data to other nodes, preferably those traveling toward the anchor location. After receiving the data, the new carrier node will periodically examine whether another handoff is needed. This process repeats until the data returns to the anchor location, and call this protocol a boomerang protocol because the data eventually return to its origin like a boomerang.

3.3.4.Data Preprocessing And Trajectory Recording

In RevTraj, need to construct trajectories from location (latitude and longitude) recordings reported by the GPS. First, to aggregate consecutive samples with little spatial distance in between (20 m in the experiments), to reduce sample noise. Next, segmentize the path, retaining only critical turning points by comparing the heading difference between the node's driving direction and the direction of the current segment

3.3.5.Divergence Detection

When on the return path to the anchor location, a node shrinks the saved trajectory by removing segments it has passed. Meanwhile, it also needs to continuously check if it has diverged from the remaining trajectory. Intuitively, a divergence from the trajectory will result in a noticeable change in the heading direction, as well as a distance increase from the trajectory. However, using one factor alone to determine divergence could be erroneous. Lane shift, the individual's driving behavior and many other factors may all lead to a sudden direction change without actual divergence. Further, the variance in road widths (e.g., 15 to 60 ft for city roads2) makes the selection of a single distance threshold difficult.samples with little spatial distance in between (20 m in the experiments), to reduce sample noise. Next, segmentize the path, retaining only critical turning points by comparing the heading difference between the node's driving direction and the direction of the current segment.

4.Functional Design And Analysis

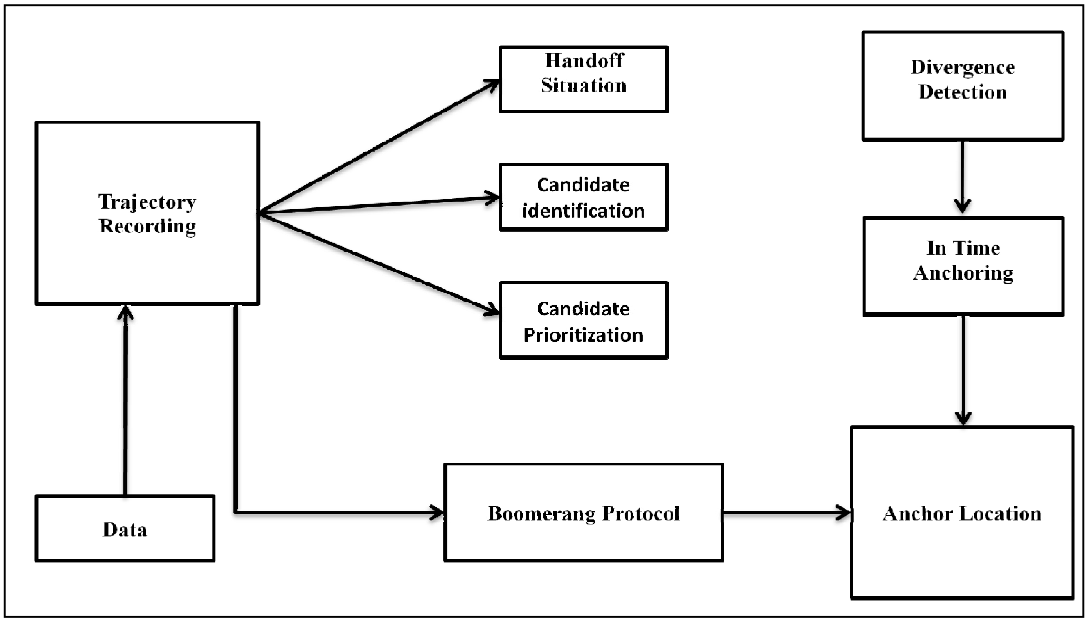

Figure 1: Overview architecture

5.Experimental Result

In this section, we study the performance of Geo cache anchoring protocol through simulation. We measure the return probability of the Geo cache when varying the vehicular density and the connectivity of the road map. The distance-based MaxProgress works better under fully or mostly connected road map topologies. We capture the connectivity characteristic using parameter given in (6).Our definition of is different from the general concept offload connectivity. Recall that in our definition, at allocation is the ratio between the number of paths that pass this location and can reach the anchor location and the total number of paths that pass this location. For both the numerator and the denominator, we only consider shortest distance paths, i.e., we do not backtrack once the map hits ahead end. According to this definition, road conditions such as dead ends will result in a relatively low value in the road map. We compare the average return time of the different policies. The metric we use here is the ratio of the average return time to the expected return time. It is an important metric because it reflects an algorithm's ability to adjust the handoff time to meet certain return time constraints. Further, small return time usually indicates frequent handoff, and thus higher communication overhead.

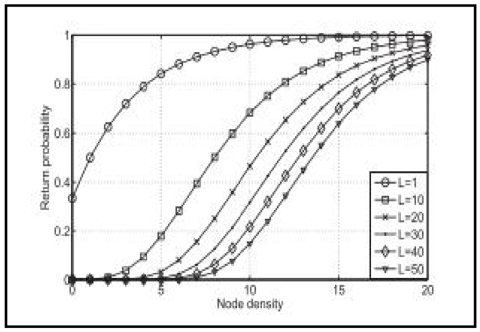

Figure 2: Analysis For Reverse Trajectory

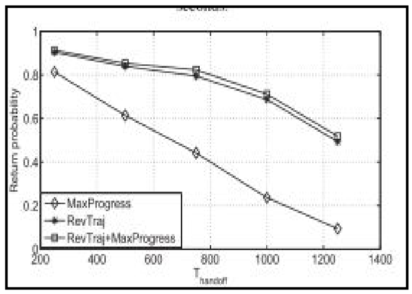

Figure3: Performance Evolution

6.Conclusion

We have presented the trajectory-based boomerang protocol to periodically make available data at certain geographic locations in a highly mobile vehicular network. The existing system have revealed the use of various traditional methods like geo cast protocol, position based routing protocol etc,.for transmitting the messages to the predefined geographical region. However these traditional systems lack the capacity of maintaining the information's regarding the missing nodes. The proposed Boomerang protocol not only aims to delivering the messages based on the trajectory oriented methods, but also to maintain the information of the missing node. The boomerang protocol seems to provide data at certain geographical locations periodically. In future the Optimized Link State Routing Protocol Provides better optimization and Periodical updates for missing nodes may obtain the better performance than the other algorithms.

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8.Reference

1. Eriksson.J, Girod.L, Hull.B, Newton.R, Madden.S and Balakrishnan.H “The Pothole Patrol: Using a Mobile Sensor Network for Road Surface Monitoring,” Proc. Sixth Int’l Conf.Mobile Systems, Applications, and Services, pp. 29-39, 2008.
2. Hoh.B, Gruteser.M, Herring.R, Ban.J, Work.D, Herrera.J, “Virtual Trip Lines for Distributed Privacy-Preserving Traffic Monitoring,” Proc. Sixth Int’l Conf. Mobile Systems, Applications, and Services, pp. 15-29, 2008.
3. Hull.B, Bychkovsky.V, Zhang.Y, Chen.K, Goraczko.M, Miu.A, Shih.E, Balakrishnan.H and Madden.S, “CarTel: A Distributed Mobile Sensor Computing System,” Proc. Fourth Int’l Conf. Embedded Networked Sensor Systems, pp. 125-138, 2006..
4. [4]Juang.P, Oki.H, Wang.Y, Martonosi.M, “Energy-Efficient Computing for Wildlife Tracking: Design Tradeoffs and Early Experiences with Zebranet,” ACM SIGOPS Operating Systems Rev., vol. 8, pp. 96-107, 2002.
5. Ko.Y.B, and Vaidya.N.H, “Flooding-Based Geocasting Protocols for Mobile Ad Hoc Networks,” Mobile Networks and Applications, vol. 7, pp. 471-480, 2002.
6. Lee.U, Magistretti.E, Zhou.B, Gerla.M, Bellavista.P and Corradi.A, “MobEyes: Smart Mobs for Urban Monitoring with a Vehicular Sensor Network,” IEEE Wireless Comm., vol. 13, no. 5, pp. 52-57, Oct. 2006.
7. Lee.U,Magistretti.E, Gerla.M, Bellavista.P and Corradi.A “Dissemination and Harvesting of Urban Data Using Vehicular Sensing Platforms,” IEEE Trans. Vehicular Technology, vol. 58, no. 2, pp. 882-901, Feb. 2009.
8. Maihofer.C, Leinmller.T and Schoch.E “Abiding Geocast: Time- Stable Geocast for Ad Hoc Networks,” Proc. Second ACM Int’l Workshop Vehicular Ad Hoc Networks, pp. 20-29, 2005.
9. Mauve.M, and Widmer.J “A Survey on Position-Based Routing in Mobile Ad Hoc Networks,” IEEE Network, vol. 15, no. 6, pp. 30- 39, Nov./Dec. 2001.
10. Yanyong Zhang, “The Boomerang Protocol:Tying Data to Geographic Locations in Mobile Disconnected Networks” IEEE Transaction On Mobile Computing,July 2012.