Data Aggregation Control for VANET--- A reviews

Ameeta B Rangari
Dr.Girish Agrawal
Prof. Parul Bhanarkar
Abha Gaikwad -Patil College of Engineering and Technology, Nagpur, India
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERI NG

Abstract-Each vehicle learns from local observations and chooses a delay based on learning results. The simulation results demonstrate that our scheme can efficiently reduce the number of redundant reports and achieve a good trade-off between delay and communication overhead. However, they cannot be applied in highly mobile vehicular environments.In this paper, we propose an adaptive forwarding delay control scheme, namely Catch-Up, which dynamically changes the forwarding speed of nearby reports so that they have a better chance to meet each other and be aggregated together

Index Terms--Data aggregation, distributed learning, Vehicular networks

I INTRODUCTION

VEHICULAR Ad hoc Networks (VANETs) have been regarded as an emerging and promising field in both industry and academia. It has potential to improve the efficiency and safety of future highway systems. One good example is traffic congestion detection. Once a vehicle detects the number of its neighboring vehicles exceeds a certain limit, it will broadcast a warning to the vehicles following behind. This warning could travel a rather long distance so that vehicles, possibly several kilometers away, can have enough time to choose an alternate route. Since each vehicle in VANETs is able to detect traffic conditions and generate traffic reports distributedly and independently, redundant reports can be generated and forwarded in the network, consuming a considerable amount of bandwidth.Bandwidth utilization is an important issue for VANET communications. For example, in Dedicated Short Range Communications (DSRC), the communication range can be up to 1,000 m, while the data rate is only 6 to 27 Mbps. Imagine the rush hour traffic, it is very likely that there are more than a hundred vehicles within the range of 1,000 m, all of which share a quite limited bandwidth.

Data aggregation is a potential approach to improving communication efficiency. It consists of a variety of adaptive methods which can merge information from various data sources into a set of organized and refined information. The process of data aggregation can be performed in-network so that communication overhead can be effectively reduced soon after redundant reports are generated.

II Motivation / Objective

Our objective is to reduce the number of redundant reports and achieve a good trade-off between delay and communication overhead.In general, our challenge is to ensure reports can be delivered to the same node at the same time in a distributed environment.

III Proposed Work

In our proposed work, each vehicle is a learner. Each vehicle maintains its local learning knowledge base and makes a decision on how much delay should be applied before forwarding a report to the next hop.The main feature of our scheme is that a vehicle indirectly learns from other neighboring vehicles' action/reward pairs, whereas, in traditional learning algorithms, the learners learn from themselves' trial and error, and they usually encourage local information exchange for better learning performance.Our method minimizes the communication overhead in distributed learning in two aspects. First, we don't need the vehicles ahead, perhaps multiple hops away, to send back a message to show the reward for the previous action. In other words, we avoid the communication overhead for reward information exchange. Second, this model also avoids the exchange of Q tables among vehicles. Q table (function) is actually a local knowledge base, usually of large volume. Therefore, this learning-from-neighbors paradigm effectively reduces the communication overhead for distributed learning algorithms. The extra communication overhead incurred by our learning process is little. As aforementioned, each vehicle attaches only three variables _; s; a to a report before forwarding it to the next hop. Since they are simple variables, the incurred communication overhead is little. We don't have extra message exchanges for the learning process. Actually, it is more important that our scheme can effectively reduce the number of redundant reports, which is a major contributing factor in wireless channel congestion and collision.

IV Implementation: Result Analysis Modules:

1. Topology and trace files generation
2. Report generation
3. CATCH-UP and graphs

1.Topology and trace files generation using NS2.

In this module we design the simulation scenario by deploying 20 vehicles in a highway and generate mobility trace files.

2. Report generation

Traffic congestion happens at one end. A nearby vehicle generates a traffic congestion report. And the vehicle applies a long (for WALK) delay before forwarding the report to the next hop.

3. CATCH-UP and graphs

The key is to apply different delays to different reports so that one can catch up with another. 1st report waits for a few seconds, collects subsequent reports and merges it together and runs forwarding the report to the next hop. We plot a delay graph which shows the relation between propagation delay and distance. And the throughput graph against time is plotted which shows the amount of data that are passing through the vehicles.

V Conclusion and future scope

In this paper, we have presented a data aggregation scheme for VANETs based on distributed learning. Essentially, the difference in propagation speed helps reports encounter each other, and we formulate this issue as a distributed learning problem where vehicles adaptively choose forwarding delays to make nearby reports have a better chance to meet each other. In order to avoid introducing extra communication overhead, we propose a new paradigm of distributed learning—"Learning-From-Others." We design a Q-learning-based algorithm to implement this new paradigm, and our simulation results demonstrate the effectiveness of our scheme. In future, we can improve our scheme to detect any delay sensitive events like an accident report and to forward this report without applying any delay (run) to any nearby hospitals in emergency cases.

VI REFERENCES

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