

A Novel Probabilistic Context Free Grammars Routing In Delay Tolerant Network

K.SATHYA^{#1} and Dr.K.SELVARAJ^{*2}

[#]Arignar Anna Govt Arts College, Vadachennimali, Attu, TamilNadu, India

^{*}Department of Computer Science, Arignar Anna Govt Arts College, Vadachennimali, Attur, TamilNadu, India

Abstract— Delay tolerant networking (DTN) is come within reach of computer network architecture that identifies so many problems for connecting point to point network connection. In this problems are solved by Mobile Ad-hoc Networks (MANETs) for environments based network connection. MANET is self-configuring infrastructure less network of connected by wireless medium. Each device in MANET moves independently in any direction and changer its link to other devices frequently. Existing geographical routing protocol like location aware routing for delay tolerant network (LAROD). LAROD is distribution of location information will not probably be very slow. The transfer of location data may start to consume too much bandwidth locally at the dense area. The dense based location aware routing for delay tolerant network (D-LAROD) does not identify mobile address and location. The CITP is means of conditional intermitting time protocol Which computes the average intermitting time between two nodes relative to a meeting with a third node using only the local knowledge of the past contacts. But CITP is does not maintain the more meeting from the contact history. In propose work the transfer of location data may start low bandwidth and very fast. The number of system location identify, information is distributed for all the nodes in the system and maintained more meeting from the contact history using the PCFG algorithms.

Index Terms—DTN, Delay Tolerant Networking, MANET, D-LAROD

I. INTRODUCTION

A Mobile Ad Hoc Network (MANET) is a continually self configuring, infrastructure less network. MANET is free to move independently in any direction and will changes its links to other frequently. The MANET is allows any device to be attached to a certain network at any time. MANET is a undefined network size. There are many problem and issues are accrued an MANET. LAROD is means of location aware routing for delay tolerant network. It is geographical routing protocol. One of the main issues on distribution of location information will probably be very slow. The transfers of location data may start to consume too mush bandwidth locally at the dense area.

D-LAROD is means of dense based location aware routing for delay tolerant network. It is geographical routing protocol with store-carry-forward principle. The nodes whose delay timer expires first is selected as the new custodian. The new custodian forwards the message in the same manner as the previous custodian. Its are more than new custodian are

used an transmission. It is also possible to producing packet duplicates. The D-LAROD is also accrued some problem. It does not identify mobile address and location. CITP is means of Conditional Intermitting Time Protocol, which computes the averages intermitting time between two nodes relative to a meeting with a third node using only the local knowledge of the past contacts. But conditional intermitting time does not maintain the more meeting from the contact history. In short the problems classify in this study on MANET with varying of node density include: the contributions of this paper are four-fold:

- The transfer of location data may start to consume too much bandwidth and very slow.
- It does not identify mobile address and location.
- It does not maintain the more meeting from the contact history.

II. EXISTING WORK

In the existing system, geographical routing protocol like Location-aware routing for delay tolerant network (LAROD). In this geographical routing protocol degrade with varying network node density such as sparse and dense topologies. Distribution of location information will probably be very slow. For dense system the transfer of location data may start to consume too much bandwidth locally at the dense areas. The density based geographical routing algorithm called density based location aware routing for delay tolerant network (D-LAROD). D-LAROD calculates the density of the network based on which the dissemination of location data takes place. But it does not identify mobile address and location.

In the existing system, conditional intermitting time protocol (CITP) which compare the average intermitting time between two nodes relative to a meeting with a third node using only the local knowledge of the past contact. It does not maintain the more meeting from the contact history.

III. PROPOSED WORK

In this proposed work the transfer of location data may start low bandwidth and very fast. It is number of system location identify, information is distributed for all the nodes in the system. The PCFG algorithm is used for to maintained more meeting from the contact history.

IV. METHODOLOGY

PCFG (Probabilistic Context Free Grammars) PCFG can be

inferred from the given real world trace collected from the actual mobile node behaviors the resulting grammar can be used to generate sequences of arbitrary length mimicking the mobile node behavior. New protocols and algorithms for wireless mobile networks benefit from their verification via simulation in their early design stages. However, such simulations require large amount of realistic mobility behavior data, which are difficult to collect. Therefore, development of methods which can generate long synthetic mobility data from sample traces is crucial for proper evaluation of protocols and applications via simulation.

The proposed novel traces generation method based on Probabilistic Context Free Grammars (PCFGs). This method takes a real world trace as input, and automatically constructs a PCFG which concisely represents movement sequences of mobile nodes. Once a PCFG is constructed from a real world trace, a large set of sentences can be produced from it creating a synthetic mobility trace.

A. Mobility PCFGs

A Probabilistic Context Free Grammar [1] consists of a five tuple $\langle Snt, St, Rg, Prob, Start \rangle$ where:

- Start is the initial non terminal symbol of the grammar,
- Snt is a list of non terminal symbols defined by production rules,
- St is a list of terminal symbols which are the symbols actually seen in the sentences,
- Rg is a list of production rules that map a string of terminal and non terminal symbols onto a non terminal symbol,
- Prob is a list of probabilities, each assigned to a rule to define the probability that this rule (as opposed to the other rules forming the same non terminal) is chosen in parsing or string generation.

B. Automatic PCFG Construction

The grammar is generalized and made more compact using two operators:

Chunking that creates a new non terminal which is assigned a string of non terminals and which replaces all the occurrences of this string in other productions with that new non terminal. Frequency of this non terminal (hence its single rule) is set to the number of replacements made.

Merging that creates a new non terminal defined as a combination of two non terminals. The right hand sides of productions of both non terminals form the productions of this new non terminal and probabilities are assigned according to their respective frequencies. The merged two non terminals are removed and occurrences of any of these non terminals are replaced by this new non terminal.

C. Algorithm PCFG()

// Problem Description: Method for creating a random route for a mobile node from the mobility PCFG given an initial location of this mobile node

// Input : Create a random node for a mobile node from the mobility PCFG

// Output: Print the location of the mobile node
 init loc =initial location

```

g =mobility grammar
for each rule r in g.START do
string = r
for each expansion stringi of string with terminal at
position 0 do
if stringi[0] == init loc then
list.add(stringi)
else
delete(stringi)
end if
end for
normalize probabilities in list
random = rand()
progressive = 0
for all expansions ei of every string in list do
progressive+ = prob(ei)
if progressive _ random then
return ei
end if
end for
    
```

V. EVALUATION

The routing protocols have been evaluated in the MATLAB. The PCFG proposal is compared with the existing geographical routing algorithms. The PCFG algorithms are used in speed are increased. The result show the more than area is covered. It also maintained more than data transmission. The PCFG algorithms are used in number of nodes are increased and more data packet size are also increased.

TABLE 1: BASIC SIMULATION PARAMETERS

Parameter	Real world	PCFG
Speed	25 m/s	50 m/s
Area	2000 X 2000	6000 X 6000
transmission	250 M	500 M

The PCFG algorithms are used in speed are increased speed and more than area are covered. It also maintained more than data transmission.

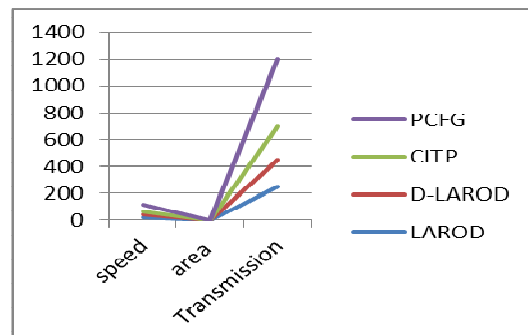


Fig 1: Overhead with respect to transmission and speed and area

TABLE 2. BASIC SIMULATION PARAMETERS

Parameter	Real world	PCFG
Speed	25 m/s	30 m/s
Area	2000 X 2000	4000 X 4000
Transmission	250 M	300 M
Bandwidth	2mbps	1mbps
No of nodes	20,40,60,80,100	20,40,80,160,320
Density	200 nodes	250 nodes
Data packet size	512 byte	600 byte

IEEE 24th Annu. Joint Conf. IEEE Comput. Commun. Soc., 2005, pp. 1228–1239.

[2] E. Kuiper and S. Nadjm-Tehrani, “Geographical routing in intermittently connected ad hoc networks,” in *Proc. 1st IEEE Int. Workshop Opportunistic Netw.*, 2008, pp. 1690–1695.

[3] T. Camp, J. Boleng, and L. Wilcox, “Location information services in mobile ad hoc networks,” in *Proc. IEEE Int. Conf. Commun.*, 2002, pp. 3318–3324.

[4] R. R. Choudhury, “Brownian gossip: Exploiting node mobility to diffuse information in ad hoc networks,” in *Proc. Int. Conf. Collaborative Comput.: Netw., Appl. Worksharing*, 2005, pp. 1–5.

[5] S. Geyik, and B. Szymanski, *Event Recognition in Sensor Networks by Means of Grammatical Inference*, in *Proc. of INFOCOM*, Brazil, 2009.

[6] C. Liu and J. Wu, *An Optimal Probabilistically Forwarding Protocol in Delay Tolerant Networks*, in *Proceedings of MobiHoc*, 2009.

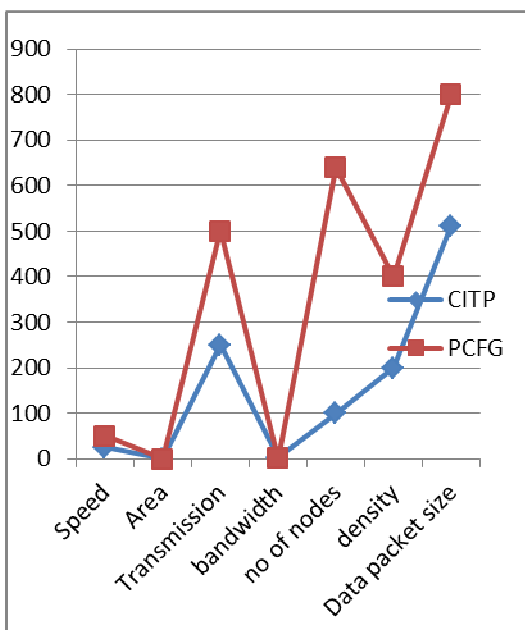


Fig 2: Overall compared CITP and PCFG

VI. CONCLUSION

This paper concluded transfer of location data may start low bandwidth and very fast. It is number of system location identify, information is distributed for all the nodes in the system. This work used in probabilistic context free grammars (PCFG) algorithms. The PCFG is maintained more meeting from the contact history. Further studies can be done on very large systems where the challenge will be how the location information is distributed for all the nodes and updated the algorithms.

REFERENCES

[1] S. M. Das, H. Pucha, and Y. C. Hu, “Performance comparison of scalable location services for geographic ad hoc routing,” in *Proc.*