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A Community based Algorithm for Mobile Opportunistic Network

S. Aakashpraveen, B. Ashwin, K.N. Akshaya, P.V. Balaji, Ms.Bakyalakshmi.V.

Dept. of Electronics and Communication Engineering, Rajalakshmi Engineering College Chennai, India

Assistant professor, Dept. of Electronics and Communication Engineering, Rajalakshmi Engineering College, Chennai, India

ABSTRACT: Novel mobile information systems are being developed with the use of smartphones. The traditional applications of wireless sensor networks such as environmental monitoring, health care, and transportation are being realized by many mobile. social network applications. Smartphones forward various onboard sensor data using a store-carry-forward way to the central repositories over the internet. In this work we propose, design and develop a Swift routing algorithm (SW algorithm), that can be used to route messages among the community members in an opportunistic manner. Our simulation-based experimental results show that our proposed algorithm outperforms other algorithms in the field under varying network conditions.

KEYWORDS: community based, SW algorithm,

I.INTRODUCTION

Opportunistic networking is a kind of delay-tolerant networking in which a number of wireless mobile nodes that communicate with each other, without the support a network infrastructure. Opportunistic networking uses locally available wireless technologies such as Bluetooth for pair-wise data forwarding hoping that the data will ultimately reach the destination. Intermittent connectivity and long delays in data delivery are inherent properties of this kind of opportunistic networking and they pose us challenges in data delivery.

What is the problem with the existing methods?

The existence of communities among larger groups of people presents us a use case for opportunistic networking where content of interest could be exchanged among the members of communities. In such communities' members are not exactly fixed toasing community and are usually connected to several communities based on their interests. Forwarding and routing content of interest among these communities should take care of the interests of the members of communities and other inherent properties of opportunistic networking. Therefore, a more efficient routing algorithm that can overcome the inherent problems of such a setup is needed. In this work we propose a community based forwarding approach which we name as Swift routing algorithm (SW algorithm) that can be used to send messages among the community members in an opportunistic manner. Our simulation-based results show that our proposed algorithm out performs three well-known a lgorithms in the field under varying network conditions.

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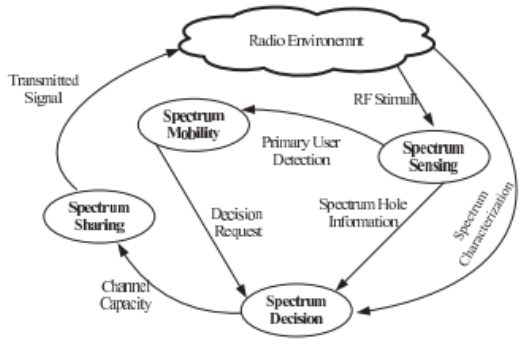

Fig. 1. Dynamic Spectrum Management Framework [2]

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II.METHODOLOGY

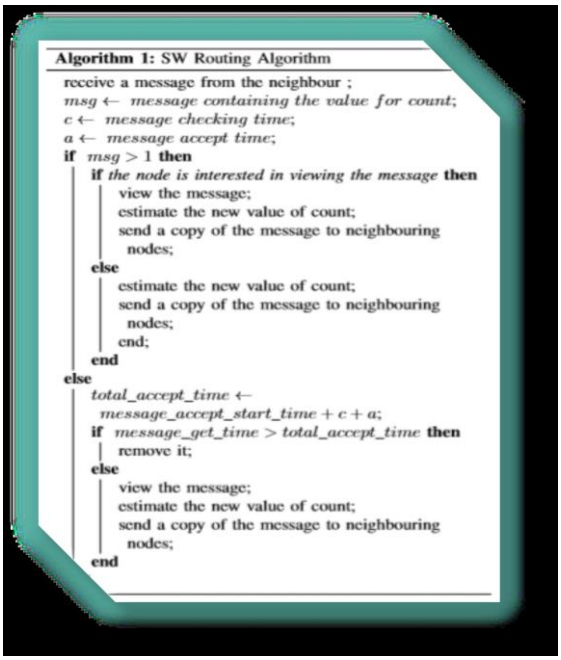
The proposed SW routing algorithm is a multi-copy algorithm and it ensures that when an order receives a message from its neighbour, the node forwards the message only to half the number of its neighbours compared to the previous node which has just forwarded the message to this node. By doing this it ensures that the message is not forwarded infinite number of times among the nodes in the network. At the same time when a message is received the algorithm also compares whether the current time is greater than the messages total accept time. This Total Accept Time (TAT) is defined as,

TAT=MAST+MCT+MAT

MAST: (Message Accept Start Time) is the time when a new message is accepted.

MCT: (Message Checking Time)is the amount of time a node will reject an incoming message it has already received.

MAT: (Message Accept Time) is the amount of time that is calculated by adding the message generate time with message generate time with the message time to live and the message check time.



Algorithm 1: SW Routing Algorithm

```
receive a message from the neighbour ;
msg ← message containing the value for count;
c ← message checking time;
a ← message accept time;
if msg > 1 then
    if the node is interested in viewing the message then
        view the message;
        estimate the new value of count;
        send a copy of the message to neighbouring
          nodes;
    else
        estimate the new value of count;
        send a copy of the message to neighbouring
          nodes;
        end;
    end
else
    total_accept_time ←
      message_accept_start_time + c + a;
    if message_get_time > total_accept_time then
        remove it;
    else
        view the message;
        estimate the new value of count;
        send a copy of the message to neighbouring
          nodes;
    end
```

III. SOFTWARE DESCRIPTION

MATLAB is a high-performance language for technical computing. It integrates computation, visualization, and programming in an easy-to-use environment where problems and solutions are expressed in familiar mathematical notation. Typical uses include:

- Math and computation
- Algorithm development
- Modelling, simulation, and prototyping
- Data analysis, exploration, and visualization
- Scientific and engineering graphics
- Application development, including graphical user interface building

A.MATLAB

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It is an interactive system whose basic data element is an array that does not require dimensioning. This allows you to solve many technical computing problems, especially those with matrix and vector formulations, in a fraction of the time it would take to write a program in a scalar noninteractive language such as C or FORTRAN.

● B. BIT ERROR RATE (BER)

The bit error rate (BER) is the number of bit errors per unit time. The bit error ratio (also BER) is the number of bit errors divided by the total number of transferred bits during a studied time interval. Bit error ratio is a unit less performance measure, often expressed as a percentage. The bit error probability p e is the expectation value of the bit error ratio. The bit error ratio can be considered as an approximate estimate of the bit error probability. This estimate is accurate for a long-time interval and a high number of bit errors

V. RESULT AND DISCUSSION

The In wireless sensor networks, a large number of sensor nodes are distributed to cover a certain area. Sensor node is little in size with restricted processing power, memory, and limited battery life. Because of restricted battery power, wireless sensor networks need to broaden the system lifetime by reducing the energy consumption. A clustering - based protocol adapts the use of energy by giving a balance to all nodes to become a cluster head. In this paper, we concentrate on recent hierarchical routing protocols, which are depending on LEACH protocol to enhance its performance and increase the lifetime of wireless sensor networks. So, our enhanced protocol called Node Ranked–LEACH is proposed. The cluster head formation happens when the node has high energy to carry the data. And the cluster head sends the data to clusters and sends to the base station. Our proposed protocol improves the total network lifetime based on node rank algorithm. Node rank algorithm depends on both path cost and number of links between nodes to select the cluster head of each cluster. This enhancement reflects the real weight of a specific node to success and can be represented as a cluster head. The proposed algorithm overcomes the random process selection, which leads to unexpected fail for some cluster heads in other LEACH versions, and it gives a good performance in the network lifetime and energy consumption compared with previous version of LEACH protocols. Hence the leach routing algorithm with SW function provides better accuracy of output in comparison of existing system.

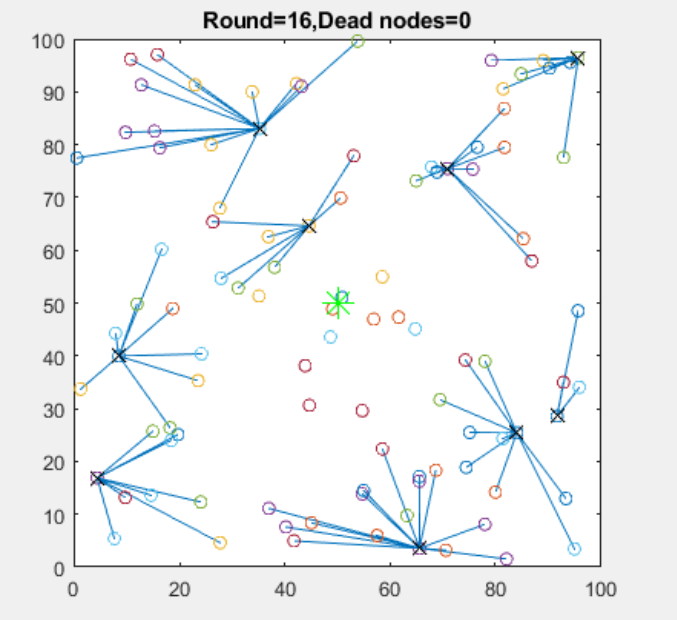

Fig1.1 Mapping of clusters

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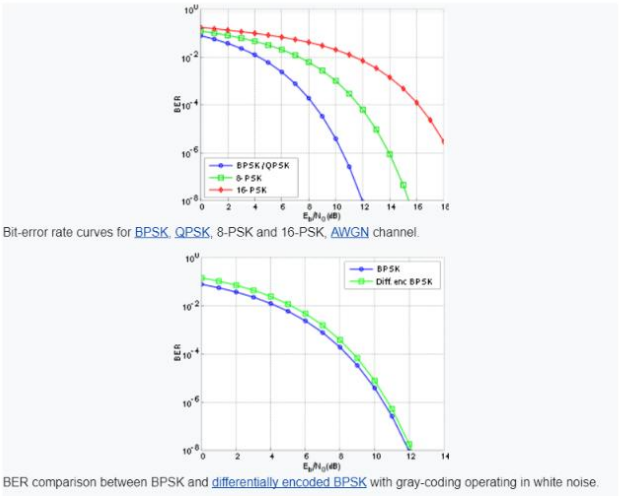

FIG 1.2 BER Comparision

VI.CONCLUSION

Our SW routing algorithm's test results show that the out performs three existing algorithms when compared with overhead with message TTL, Message size and Buffer size. In some of the case the proposed routing algorithm exhibits a steady performance when compared with the three algorithms.

•SW routing algorithm can use to promote business ideas based on customer's interest. We can send promotion messages among co

Mmunity members.

•As a future work we would like to improve the proposed algorithm for larger communities of people.

•Therefore, different kinds of communities and their interests vary greatly, and the algorithm accurately takes care of routing in a more efficient manner.

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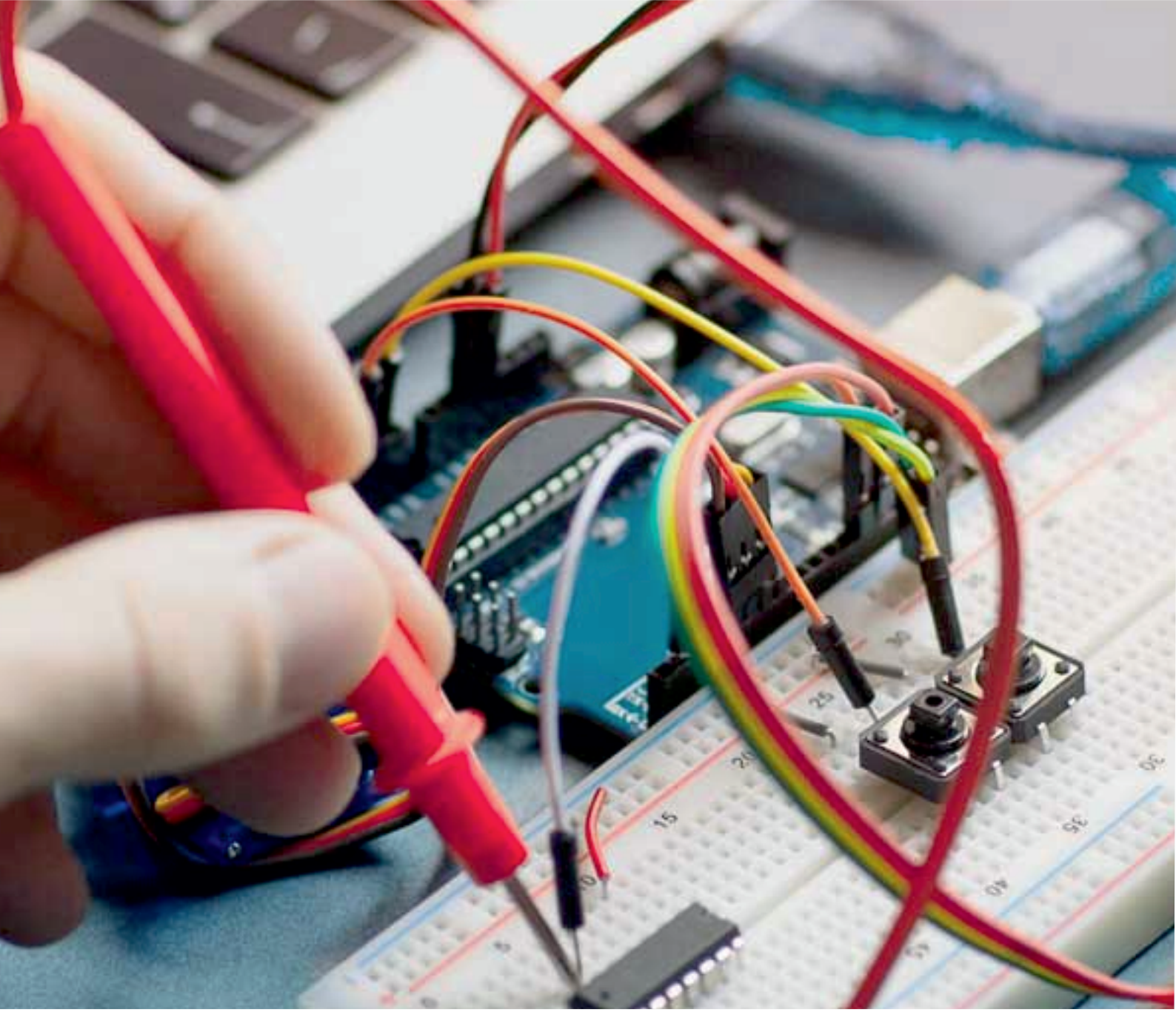

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