Reviewer 1

The authors introduce the concept of rendezvous place where the passing nodes can announce, deposit or pickup their own messages without having to meet the other nodes carrying the desired message. In the proposed scheme, the rendezvous place is detected automatically and its areas size and shape are dynamically changed according to the interaction among nodes passing around the area. The results from simulations show that their proposed routing algorithm can achieve higher delivery ratio and utilize lower energy consumption than original opportunistic routing algorithms especially in sparse network environment.
It is true that by introducing the several mechanisms, the authors proposal can achieve the performance in terms of the packet delivery ratio and energy consumption.

[Question 1]

However, is the opportunistic routing actually applicable in the real situation? The delivery ratio of 90% or less is quite insufficient, it is worse that the delivery ratio is much dependent on the network parameters. It may be the reviewers personal opinion. Thus, the authors should clearly state the actual application scenarios of the proposed method.

[Question 2]

In the paper, the authors refer to the wildlife monitoring. If it is one application that they suppose, they should consider the simulation model based on it. The reviewers feeling is that the simulation model is too generic, and the readers could not have a confidence that the proposed method is useful. The same argument can be applied to the predictable behavior of OppNet nodes. Its applicability must be heavily dependent on the target system. Perhaps a more realistic realization is to use mobile robots to collect information around the field. Even in the sparse environment, the path planning method can make the delivery ratio of packets higher. See the related papers.

[Question 3]

In summary, for the paper to be accepted, the authors clearly describe the application of the proposed method, and show the simulation results based on the application scenarios. Also, they should discuss why the proposed method is better than the other methods including the planning method using the mobile robots.

Reviewer 2

This manuscript proposed a concept of rendezvous place for improving delivery ratio and reducing energy consumption in sparse opportunistic networks. But some details are still unclear.

[Question 1]

How long could a message stay in the Rendezvous node buffer, if the Rendezvous node didn't encounter the target node?

In the opportunistic network environments, a message is commonly embedded with a time-to-live (TTL) parameter (or called a message deadline) which stops the packets from traveling unnecessarily throughout the network [5, 8, 4, 3]. Our provious work [2] has shown that the different value of message deadlines can affect the delivery ratio. In our design, each message will be dropped once it reach the message deadline in order to clear the messages left on the buffer of Rendezvous node. If the capacity of data storage in Rendezvous node is fully occupied, then the oldest messages will be dropped once the new messages arrives. In our simulation, we setup the TTL to the simulation time in order to hold the messages in the Rendezvous zone as long as possible. We assume that Rendezvous buffer is large enough to feasible store as many messages waiting to pickup by target nodes. Therefore, the messages will indefinitely stay in the Rendezvous node buffer until the storage is full and the newer messages request the space from the buffer.

[Question 2]

If the Rendezvous node can't find the expected node-gathering area for a long time, does it keep moving? In this process, is it broadcasting the Rendezvous Area rumor message (RA)?

In our system, the Rendezvous node will move to a new location if there is insufficient contact from OppNet node within a predefined duration. Consequently,the Rendezvous node will situate in the node-gathering area when there is enough number of encountered OppNet nodes. Therefore, the Rendezvous nodes will keep moving until they meet the desired conditions. In addition, in the process of moving, the Rendezvous node will keep broadcasting the Rendezvous Area rumor message (RA), so the OppNet nodes can learn that they are in the Rendezvous zone when they detect the RA messages.

[Question 3]

Moreover, how does it determine its center location when implementing sweeping algorithm? How do you see the relationship between the period of sweep mechanism and the period of searching Rendezvous place?

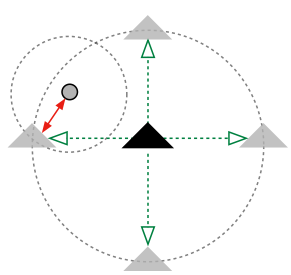

Figure 1: Sweep mechanism

Reviewer 2 [[Question 3]] continued on next page...

The sweeping mechanism is started when the Rendezvous node station in the desire location in order to gain more delivery ratio from the nodes with different transmission range. The center location of Rendezvous for the sweeping algorithm is determined by its radio range since the Rendezvous node can move to 4 direction as in Fig. 1. The period of sweep mechanism and searching Rendezvous place are irrelevant since the sweeping always performs when the Rendezvous node is stationed while the period of searching is depended on the encountered OppNet nodes.

[Question 4]

The Rendezvous node should passively wait for the target node entering the Rendezvous place. Does it harm the efficiency of packet delivery, compared with some latest opportunistic routings?

In our implementation, the Rendezvous node can move with the Sweep mechanism to gain more chance of meeting the node with less transmission radio range. Thus, this mechanism can increase the performance of packet delivery while most of the recent opportunistic routings such as Throwbox [7, 1] or passive relay points [6] which recieving nodes are more passively waiting for the contact nodes.

[Question 5]

Furthermore, some of the references in the section 2 are too old. And author should choose at least one recent opportunistic routing protocol for comparison in the evaluation.

References

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