Survey on Opportunistic Networks in Delay Tolerant Mobile Sensor Networks

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***Abstract*—Delay Tolerant Network is an emerging research field in Mobile sensor network. It use forwarding technique to transmit the message from source to destination, there is no complete path between sources to destination. Due to mobility of nodes there is frequent change in node paten and difficult to find the path, there is chance that message keep on forwarded inside the network. In this paper we made detail survey on Opportunistic Routing Protocol in mobile network, and in that node getting the message form neighbor node and moving away from Sink. We proposed a technique in Gradient based Routing Protocol to solve node moving away from sink with message.**

Keyword: Delay tolerance Network, Opportunistic Network, Gradient based Routing, Mobile Nodes.

I. INTRODUCTION

During the last few years' research on multihop ad hoc networks has focused on a number of application environments. Originally conceived for military applications, and aimed at improving battlefield communications and survivability, multihop ad hoc networks have lately been pro- posed in many civil scenarios [1]. As far as the application environments of these networks increase, their traditional communication paradigms need adequacy. Two main evolutions of multihop ad hoc networks are envisioned, namely, *mesh networks* and *opportunistic net- works*. In this article we focus on Opportunistic Networks.

Opportunistic social networks are intermittently connected ad hoc networks, where information is disseminated through opportunistic wireless communication among nodes, whenever there is a contact. This infrastructure less networking, enabled by human held mobile devices [2], has many promising applications including disaster rescue [3] and mobile crowd- sensing [4]. In these networks, an important research problem is routing. Recently proposed routing protocols use social network analysis to make routing decisions since humans' social structure is not prone to rapid changes [5]. Messages are forwarded from source to destination in a hop-by-hop manner. Any node can serve as a forwarder as long as it is able to bring the message *closer* to destination.

Although recent studies have demonstrated the practical potential for opportunistic communication using smartphones [6] and opportunistic social networks have been shown to support new paradigms of computing [7], several research challenges have not been satisfactorily addressed. For example, opportunistic forwarding has only been treated as a point-to-point contact between nodes, as opposed to a simultaneous contact among multiple nodes. This is possibly due to the fact that opportunistic social networks have been essentially treated as delay tolerant networks (DTN), and some assumptions for DTNs were not re-considered for social networks.

In DTNs, the contacts are assumed to be very sparse. Only pairwise contacts are considered when designing forwarding strategies [8], and thus, links are only responsible for transferring the message to the encountered node. Since contacts in opportunistic social networks may be more frequent than in traditional DTN, some nodes may have more than one neighbor occasionally. This has been confirmed recently in studies on temporal communities [9] [10], where the nodes in a group tend to meet each other frequently during some time window. Nodes with two or more neighbors may then take advantage of the broadcast nature of wireless link, instead of viewing the contact as multiple individual point-to-point links. Furthermore, the routing decision may also be impacted in situations when a node has multiple neighbors at the same time. For example, when multiple nodes are eligible to be the next hop for a packet, the current message holder may want to forward it to the next hop with the largest delivery probability, which requires the routing protocol be aware of multiple ongoing links.

Delay Tolerant Mobile Sensor Networks (DTMSNs) [11] are a type of sensor networks, which is derived from Delay Tolerant Networks (DTNs) [12]. DTMSNs have much way to collect data efficiently for application domains in which it is preferable to attach sensors to mobile objects, e.g., humans, animals, or vehicles. DTMSNs have several unique characteristics, such as mobility of sensor nodes, sparse network density, limited buffer space, or short radio communication range. Since these characteristics lead to frequent changes in network topologies, it is rarely possible to form a end-to-end path between a mobile sensor node and a sink node in DTMSNs. Therefore, traditional data collection methods proposed for wireless sensor networks [13], which rely on immobile sensor nodes and highly node density, may result in poor performance due to characteristics of DTMSNs.

Routing methodologies in DTMSNs can be classified into two types, i.e., single-copy and multi-copy routing schemes. Multi-copy routing schemes replicate copies of the message and distribute them to the network in hope of one of the copies successfully arriving at a sink node [14], [15]. Although these approaches achieve efficient data delivery, they tend to consume a lot of network resources.

Here concentrate on single-copy routing schemes; make no copy of a message and focus on how to relay messages to the sink node in order to achieve efficient data delivery. single-copy routing schemes in DTN is other wise called as Opportunistic Network, Although multi-copy routing schemes generally outperform single-copy routing schemes in terms of the delivery delay or ratio, single-copy routing schemes are much less wasteful of network resources since there exists only a single copy of a message in the network. Moreover, the single-copy routing schemes constitute the building blocks of multi-copy routing schemes, that is, the many of multi-copy routing schemes can adopt algorithms of single-copy routing schemes to achieve efficient data delivery of messages copies. Thus, selecting a proper relay node leads to not only efficient single-copy routing but also more efficient multi-copy routing. For those reasons, it is crucial to design an algorithm of single- copy routing for DTMSNs.

In single-copy routing, each node calculates a value that indicates how useful a node might be in relaying messages to the sink node and transmits messages according to this value. When a node meets other nodes, it transmits a message to the node with the highest value [16].

II. LITERATURE SURVEY

The literature survey is classified into three sections and presented as follows in this section,

1. Gradient based Routing Protocol
2. Geographical based Routing Protocol
3. Routing Protocol in Opportunistic Networks

A. *Gradient Based Routing Protocol*

Hideyuki Kanai, Yuki Koizumi, Hiroyuki Ohsaki, and Makoto Imase [17], There is no end-to-end complete path between source and destination nodes due to node mobility, it is hardly possible to collect topology information and find the minimum weight paths to transmit the message form source to destination. One promising approach to route messages on DTMSNs is to utilize gradient-based routing approaches. In gradient-based routing, each node has a indicates how useful a node might be in transmitting messages to a sink node and transmits messages according to this gradient metric. More precisely, each node *i* has a gradient metric G_i and the sink node, i.e., the destination node of messages, has the highest gradient metric among all nodes in the network. When node *i* meets other nodes, node *i* transmits messages to node *j* whose gradient metric G_j is the highest among neighbor nodes of node *i*. Author did not talked about node mobility, so there is possible that node getting the message from neighbor node and moving away from sink with out delivering the message to sink it cause inefficient message relays caused by node mobility around sink nodes.

Bernd, Arturas, Andreas, Carmelita, Slobodanka [18], To avoid node moving away from sink author introduce a new technique called Mobile Gradient (MG), The decision to forward a message can be based on different types of information. In the presented approach the decision is made based on the conditional information about the nodes' current position and movement relative to a sink (sinks), and relative to other nodes in its short-term neighborhood. But Author proposed a method based on two measures: the Received Signal Strength Indication (RSSI) and the mobility gradient (MG). RSSI is used to calculate the Distance between the Source and Sink, and the Mobile Gradient is used to find the node movement like node moving away from Sink or towards the Sink. With this two parameter we can find the correct best neighbor node(BNN) to transmits the message. Problem is finding the BNN is a problem because most of the eligible node will be left out due to the distance and node moving away from sinks it may cause delay in transmitting the message to sink.

Faiza Nawaz, Varun Jeoti [19], In this paper Author present a new approach in Gradient based routing protocol by adding a approach in Network Coding this approach is done in Sensor network where nodes are not mobile. In this approach each node sets up its gradient value as its minimum number of hops distance from the sink. The sink is responsible for building and maintaining the gradient field. Nodes that are near the sink have smaller gradient number as compared to the ones farther away from sink. The data collected by a sensor or interrogator follows the direction of descending gradient to reach the sink. During the gradient setup process, sink is able to communicate only with members that are at a distance of one hop from it. Initially the cost of sink is set as zero and each node sets its cost to ∞. The sink broadcasts an advertisement message 'ADV', containing its own cost (0 initially), upon receiving the ADV message from sink, node A and B sets their path cost as $C_A = C_{sink}+1$ and $C_B = C_{sink}+1$. Once node A and B sets their gradient value (cost), they creates a new ADV packet containing its own cost value and broadcast it to its neighbors. Neighbors will select the minimum cost value received (as they have many neighbors); add 1 in that value and further broadcast it as their own gradient value like wise it will fine the minimum cost to transmit the message to Sink. In this approach we fine the shortest path to transmit the message to Sink but this kind of approach will not suit in mobile nodes it will keep on changing the position we cant find the next best neighbor to transmit the message.

Do Duy Tan et al [20]. proposed a gradient-based traffic-aware routing (GRATA), At first, one node serving as a sink advertises its role by flooding an ADVER (advertise) packet throughout the network. The flooding (broadcasting) occurs at time one sink (root) claims its role or update its database. An ADVER packet contains the routing address (sink address i), sender address and n_i, d_i of the sender node. Once a node receives the ADVER, it update the height cost Φ^d values of the current node itself; if Φ^d is changed, the current node then rebroadcasts ADVER not instantly but after a random delay to reduce duplicated gradient information packets one node checks whether or not the routing address or sender address in ADVER is listed in height index table H. If not, then the current node accepts the sender as its parent corresponding to the routing address sink

B. Geographical Based Routing Protocol

Long Cheng, Jianwei Niu, Jiannong Cao, Sajal K. Das, and Yu Gu [21], In this paper Author explain routing in Geographical Opportunistic network, here in this selecting the Candidate nodes is important the location information of each node is available. So with that information we can find the neighbor node location and Sink node location we have to fine the exact candidate node so that the message will reach the Sink. Here we use forwarding technique to find routes, with the help of candidate nodes, which are stored in forwarding candidate table (FCT) of every node. With the help of node location we have to choose set of candidate node that are neat to Sink that is done in Network layer. From that set of nodes only one is selected in in Mac layer to forward the message as an actual relay based on reception result. It uses Pareto principle (also known as the 80-20 rule in the field of economics) states that, for many events, roughly 80 percent of the effects come from 20 percent of the causes. We observe that there also exists similar Pareto principle in GOR (Geographical Opportunistic Routing). That is, the first two or three candidates in the ordered forwarding candidate set take most forwarding tasks for each hop. With this we fine the shortest path between the sources and sink. In this method, there is no efficient QOS because problem in end-to-end reliability and delivery of packets. There is a chance packer keep on forwarding in side the network it cause delay in delivering the packet.

Shanshan Lu, Yanliang Liu, Yonghe Liu and Mohan Kumar [22], In this paper the author explain in detail about Location based routing in Opportunistic network (LOOP). Firstly predict future movement of a node based on its mobility trace, each message forwarded in networks contains information headers including <source>, <source location>, <destination location> and <TTL>. The goal here is to find proper relays to route the message from source location to destination location. In order to achieve this, predicting a node's future locations is necessary, by getting the this information we can get the information of future node movement. Then secondly, ability to deliver a message is evaluated by defined metrics with this we find the exact movement of the node. Once the movement pattern is extracted, we quantify its ability to deliver a specific message toward a location. For one location in a piece of pattern, we develop Current-landmark and Original-landmark metrics that use current and original location as landmark to measure how close the device can carry the message to its destination. These metrics incorporate delay factor that can balance delay and closeness. Based on these metrics values, we then evaluate the delivery probability, which measures a node's ability to deliver a message to its destination location. In the movement pattern table, multiple patterns exist for different sets of day type and time slot. Problem to finding the node movement using trace file may not me exact, because it calculate the future location from privies movement it cause delay in delivering the message to sink.

S.Sharon Ranjini, G.ShineLet [23], in this paper author states the problem of delivering data packets for highly dynamic mobile ad hoc networks in a timely and reliable way. Each node will send hello packets to its neighbor node, which are in its communication range to update their topology. After the topology is updated by sending hello packets, geographic routing and opportunistic routing is achieved in position-based opportunistic routing. Here the nodes will know their own location and the position of its neighbors. When a source wants to send a packet it finds the location of the destination node first. For routing, the geographic ad hoc networks use position information. Position-based routing is used to handle networks that have many nodes. It uses location information to forward data packets, in hop-by-hop routing manner. This protocol tracks the mobile node locations. It has high scalability. The source node should know the location of the destination node, before routing a packet using a geographic routing. GREEDY PERIMETER STATELESS ROUTING (GPSR), a routing protocol used for wireless network to find the positions of routers and a packet's destination for packet forwarding decisions. In GPSR, Geographic routing is a location based routing protocol for wireless network. The data generates a packet that has the co-ordinates of the destination node. In the greedy forwarding method, the node, which has more positive progress towards the destination, will be selected as the next hop forwarder. The neighbor who is away from the sender is chosen as the next hop, in the operation of greedy forwarding. Author did not address the problem to find the path between source and destination when there are number nodes, difficult to find the correct relay node to forward the packet.

WU Qiwu et al [24]. Proposed a GeoDTN+Nav protocol; each vehicle is equipped with virtual navigation interface (VNI). VNI is a lightweight package interactive interface with underlying vehicle components, which is to find the adjacent vehicles and provide the navigation interaction information with consistent format. The VNI basic data format is defined as a two-element group (*Nav_info*, *Confidence*). Wherein, *Nav_info* represents the predicted routing information including a detailed route, the destination and the movement direction of vehicle. GeoDTN+Nav protocol provides three forwarding models: the greedy model, boundary model and delay tolerant networks (DTN) model. (1) Greedy model. The current vehicle will choose next forwarding node in such a way that is closer to sink node. (2) Boundary model. If there are no neighbor nodes to forward the packet and itself cannot forward the packet to sink due to limited communication range. Then that vehicle will enter the boundary model. (3) DTN model. When the network is not connected, the vehicle nodes will store and wait for an opportunity to forward the data packets.

Jason LeBrun et al [25]. authoe describes five opportunistic forwarding strategies, including two basic methods for baseline comparisons, and three knowledge-based schemes that leverage location and mobility information exchange between nodes. (1) *NOTALK* is similar to the strategy used in the Data Mule project. An MR will accept data from a data source and cache it in its buffer. The MR will continue to carry this data until it receives a RESPONSE from the destination (2) *BROADCAST* is the other extreme compared to *NoTalk*, where an MR unconditionally exchange data with every other MR it meets—whenever a MR hears a RESPONSE from another MR, it will forward all of the data in its buffer (3) *Location-based* is a form of greedy, geographical-based routing. An MR forwards data to a responding neighbor only if the neighbor is closer to the destination than its own current position. (4) The *Motion Vector (MoVe)* scheme leverages the knowledge of relative velocities of an MR and its neighboring nodes to predict the *closest distance* that they are predicted to get to the destination, following their current trajectories. (5) The *MoVe-Lookahead* method uses the basic rules as in MoVe, with one modification. Now, each MR "looks ahead" for its next *waypoint*, where its trajectory changes. If a node C changes its directions before it reaches the point at which it will be closest to the destination, the distance between the waypoint and the destination is used instead as an estimate of d_C in the forwarding decision phase.

C. Routing Protocol in Opportunistic Networks

Xiaofeng Lu et al [26], in this paper author explain about the Epidemic Routing Protocol for Delay Tolerant Networks. In Epidemic routing nodes forward the packet instead of flooding, it forward the packet when it comes to a neighbor, we do not know which node will forward the packet to the destination, so the more nodes have received the packet, the larger probability that the destination can receive the packet. If nodes forward packets by basic epidemic routing, nodes transmit packets whenever they meet a neighbor and they may transmit a packet many times. So author proposed n-Epidemic routing, where in n-epidemic routing, we assume that a node forwards a packet only when it has at least n neighbors. By n-epidemic routing, a node cannot send a packet as casually as by basic epidemic routing, so we have to determine the value of n carefully. If n is large, the probability of a node having so many neighbors is low and the chances that this packet is sent out are few. If a packet cannot be spread out widely, the destination has low probability of receiving it. On the contrary, if n is very small, nodes have lots of chances to forward a packet, so the batteries energy will be used up quickly. The key step of n-epidemic routing is to determine the value of n. If nodes forward packets by basic epidemic routing, nodes transmit packets whenever they meet a neighbor and they may transmit a packet many times. It causes loss of energy and chance of packet not reaching the destination.

Guizhu Wang, Bingting Wang, Yongzhi Gao [27], In Dynamic Spray and Wait with Quality of Node delivery rate stay the same. The Epidemic and The Spray and Wait routing protocols forward messages without taking node mobile patterns into consideration, therefore the delivery utility is too low. Now, Author presents the notion of QoN. QoN indicates the activity of a node, or the number one node meets other different nodes within a given interval. In the same period of time, the more nodes that one node meets, the greater the QoN. The variation of QoN can dynamically represents the node activity in a given period of time. Using the ratio of QoNs to dynamically forward the number of message copies. Moving in the network, the node will encounter more and more nodes. In the real network situation we will add a number of new nodes from time to time. Some nodes have been in the network for a long time, whose QoN are larger. However, new nodes QoN are smaller. Therefore, we divide time into a series of fragments at the same length. We calculate QoN on each fragment and consider the influence of the QoN in former fragment on the QoN in the current fragment. Author didn't address about node forward the message to it neighbor with out knowing whether it will reach the destination .It cause delay in delivering message

Eyuphan Bulut, Sahin Cem Geyik, Boleslaw K. Szymanski [28], In this author says about Shortest path routing protocols for DTN's, It is based on the designs of routing protocols for traditional networks. Messages are forwarded through the shortest paths between source and destination pairs according to the costs assigned to links between nodes. Furthermore, the dynamic nature of DTN's is also considered in these designs. Two common metrics used to define the link costs are minimum expected delay (MED) and minimum estimated expected delay (MEED). They compute the expected waiting time plus the transmission delay between each pair of nodes. Routing decisions can be made at three different points in an SP based routing: i) at source, ii) at each hop, and iii) at each contact. In the first one (source routing), SP of the message is decided at the source node and the message follows that path. In the second one (per-hop routing), when a message arrives at an intermediate node, the node determines the next hop for the message towards the destination and the message waits for that node. Finally, in the third one (per-contact routing), the routing table is recomputed at each contact with other nodes and the forwarding decision is made accordingly. In these algorithms, utilization of recent information increases from the first to the last one so that better forwarding decisions are made; however, more processing resources are used as the routing decision is computed more frequently. Author doesn't talk about the message reaching the sink.

Zhi Ren, Hong Chen, Jianling Cao, Yukun Yao [29], Author proposed Epidemic Routing (ER) protocol can offer a reliable way to transmit data by finding the best cross layer neighbor selection (CNR). If a node senses the information from other nodes through carrier sensing in the PHY layer, it will notify network layer immediately by cross-layer information sharing, and achieve to sense encountered nodes in the network layer. If it doesn't sense, it will not operate cross-layer mechanism and deliver any packets. After the PHY layer of a node senses the information from other nodes and notifies the network layer by cross-layer information sharing, it will close the cross-layer function between the PHY and network layer to avoid repeatedly reporting for this encountered node. Then, the node will collect the cross-layer status information at the network layer. If the status is "close", the network layer sends an "open" message to the PHY layer after the timer value of HELLO packets reaches T and also a HELLO packet has been delivered. By this finding the best neighbor to transmit to sink.

GUO Da et al [30]. Proposed from traditional epidemic routing model. Using the meet rate between infected nodes and the uninfected nodes, we can get the Markov chain, whose number of state is the number of the a copy of the message in the network. It can be deduced by the Markov chain model that in time t, the probability that N nodes have the number of message copies is k in the network. The design target of restricted epidemic routing (RER) is to reduce the number of message copies in the network. Instead of forwarding the messages to all neighbor nodes, the node may only forward the messages to the high priority nodes. Author show three different kinds of schemes and these solutions are collectively referred to as copy control scheme of limited Epidemic in Opportunistic Networks, including limited nodes scheme (LNS), limited forwarding time scheme (LTS), limited copies scheme (LCS).

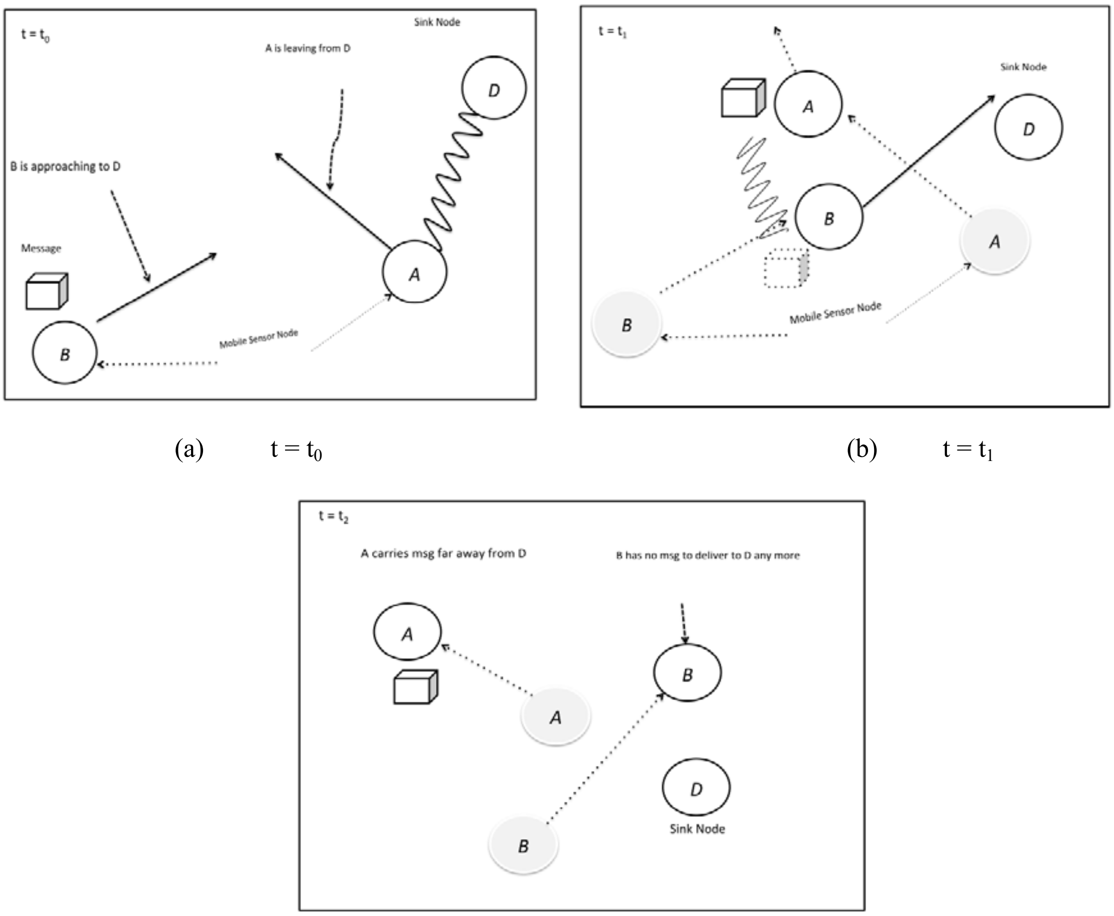
John Burgess et al [31]. MaxProp uses several mechanisms to define the order in which packets are transmitted and deleted. At the core of the MaxProp protocol is a ranked list of the peer's stored packets based on a cost assigned to each destination. (1) *Estimating Delivery Likelihood:* optimal delivery paths in a DTN can be discovered by constructing a directed graph of nodes connected by edges representing traversals through time and space. A variation of Dijkstra's algorithm can determine the shortest path, if one exists. In practice, no oracle is available to reveal future connections. MaxProp therefore assigns link weights. (2) *Complementary Mechanisms:* Unlike other protocols, MaxProp involves several other mechanisms beyond this core that increase the delivery rate and reduce latency. When two peers discover each other, MaxProp exchanges packets in a specific priority order. (3) *Managing Buffers:* The difference between managing limited storage and limited transmission is that packets that are sent in one transfer opportunity may be sent in the next opportunity. In contrast, if a packet is dropped from a buffer, it may never be delivered.

III. ISSUES IN OPPORTUNISTIC NETWORKS

During the course of this literature survey the following observations have been obtained

- Majority of the papers surveyed have a problem in delivering the message to sink because of source node not finding the correct neighbor node which will delivery the message to sink.
- There is no proper method to find the best neighbor node, so than the packet reaching the destination node is a problem or packet loss.
- In most of the routing protocol the packets will be forwarded within the network for long time due to node mobility, it will cause delay in delivering the packets to sink.
- Another problem is while forwarding the packet to long distance nodes the quality of the message in reduced so we have to choose the node in such a way that they are near to the sink and the source for better quality of delivering to sink.

IV. INEFFICIENT MESSAGE RELAYS IN OPPORTUNISTIC NETWORK



(a) $t = t_0$ (b) $t = t_1$

(c) $t = t_2$

Fig1. Inefficient Message Relays

In Fig 1. Circles *A* and *B* are mobile sensor nodes and a circle *D* is a sink node. At time t_0, node *A* communicates with a sink node *D* and *A* is going to leave from *D*. Node *B* is approaching to the sink node *D* with a message Fig. 1(a). Then, node *A* meets with *B* at time t_1 as shown in Fig. 1(b). At this time, *A* has a higher gradient metric than *B* does since *A* met with the sink node *D* at time t_0. In Opportunistic routing protocol, nodes transmit their messages to a node that have a higher metric. Therefore, *B* transmits its message to *A* along an uphill gradient. However, *A* will carry the received message far away from the sink node *D* at time t_2 and *B* has no messages to deliver to the sink node *D* when they communicate with each other at time t_2 as shown in Fig. 1(c).

To over come this problem, we are going to use two measurements Received Signal Strength Indication (RSSI) and the mobility gradient (MG). RSSI is a power level (usually in dBW) that indicates the received power of a sink beacon, i.e., the relative distance to the sink. An RSSI threshold is defined as a minimum RSSI required to be able to communicate. Based on the periodic tracking of the RSSI level a node can calculate the mobility gradient MG as a measure of the node movements relative to a sink.

The mobility gradient can have 3 values:

- MG = 1 if the node moves towards the sink,
- MG = 0 if the distance to the sink is constant,
- MG = -1 if the node moves away from the sink.

The node's relative movement is detected by analyzing the difference between consecutive RSSI values. As varying channel conditions and noise usually induce some variation in the RSSI values, a variation threshold is defined. This threshold is used in the mobility gradient MG = 0 case, as otherwise, the mobility gradient will be continuously changing. If a node is out of communication range of a sink and another node is in a more advantageous position, the nodes have to obtain knowledge about this in order to be able to act as multi-hop relays.

With the help of RSSI and MG we can find the Best Neighbor Node (BNN) if it is reasonable to forward data through this node can reach the destination.

V. SOFT WARE TOOLS USED

- NS-2 [32], the network-performance analysis tool is driven by condition of Linux d Unix optimally. It is possible to run after installing Cygwin, the wired or wireless network, d it is the usable network-performance- analysis-using download from Internet without cost, applies it.[33] NS-2 simulator can simulate various Internet protocols like TCP/IP protocols family (e.g. TCP, UDP, FTP, HTTP), routing protocols and multicasting protocols.
- ns-3[34], is a discrete-event network simulator for Internet systems, targeted primarily for research and educational use. The design goals of *ns-3* [35], have included providing the simulator core "with tools to that allow for highly customizable extraction of event logs and output statistics, to provide a framework for managing large numbers of simulation runs and output data, and to allow third-party analysis tools to be used where possible".
- OMNeT++[36] is a discrete event simulator for studying protocols for wired and wireless networks. OMNeT++ is designed to model the communication network and distributed systems. The important part of OMNeT++ is the Eclipse based simulation IDE,[37] a graphical runtime environment, and a host of other tools. There are extensions for real-time simulation, network emulation, database integration, SystemC integration, and several other functions. From IDE one can design simulation models. It has simulation configuration editor, C++ build support a simulation launcher, which is capable of running simulation in batches. Results can be plotted and analyzed by a analyzer tool. Simulation results can be observed on sequence chart.
- QualNet 5.0.2 [38] simulator. It is a simulation platform that can predict wireless, wired and mixed platform network and networking device performance. [39] QualNet software can explore and analyze early- stage device designs and application code in closed, synthetic networks at real time speed or faster. Simulation is a cost-effective method for developing, deploying and managing network-centric systems throughout their entire lifecycle.

VI. CONCLUSION

Opportunistic network is an emerging system that is getting growing interest in networking research community. The opportunistic network places different research challenges on different layers of a protocol stack. In this paper, we provide a literature survey on Opportunistic network in different routing protocol, the proposed methodology is a idea for issues that arrived in the survey. This work is aimed to serve as an introductory material to people who are interested in pursuing research in this area.

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