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# Speed Protocol for Guarantee of QoS Parameters Using Bacterial Foraging Optimization in MANET

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**Abstract:** *In this proposal, we present the state of the research by summarizing the work on QoS based routing protocols that has already been published and by highlighting the QoS issues that are being addressed. We present a spatiotemporal communication protocol for sensor networks, called SPEED for optimization purpose. SPEED is specifically tailored to be a localized algorithm with minimal control overhead. End-to-end soft real-time communication is achieved by maintaining a desired delivery speed across the sensor network through a novel combination of feedback control and non-deterministic geographic forwarding. SPEED is a highly efficient and scalable protocol for sensor networks where the resources of each node are scarce. Experiment results shows that SPEED protocol has been effectively applied for optimization of various parameters in MANET.*

**Keywords:** *MANET, SPEED Protocol, Qos, Optimization.*

## I. Introduction

The increasing concentration in concurrent QoS based routing in network has received an extensive attention from the research area. Many Quality Service based routing protocols have been surveyed but neither gives the appropriate accuracy. For enhanced functioning and a longer life span for a sensing node within the system, we require to reflect on its energy utilization as a chief factor of concern. Sensor networks consist of a number of sensing nodes which are distributed in a wide area [1]. They sense an occurrence happening in the surroundings and these sensing nodes are dispersed according to the necessities of the application. superiority of service ensures the useful communication inside the given or bounded delay time. Protocols should ensure for system stability, superfluous data should be transmitted over the network for any type of traffic sharing. It also desires to maintain positive resource preventive factors like bandwidth, memory buffer size and processing capabilities. Scalability is a significant factor in sensor networks. A network region is not always stationary, it changes depending upon the user necessities [4]. All the nodes in the complex area must be scalable to adjust themselves to the changes in the system structure depending upon the nodes entered by the user. The sensor nodes can be mobile or static depending on the application.

A lot of research studies are being done on Quality-of-Service (QoS) routing protocols to enhance their efficiency. Limited resource constrains like limited power energy, limited communication capability, limited processing and storage capacity make it difficult to design a MANET meeting QoS real-time routing. Many designed QoS routing protocols are SAR (Sequential Assignment Routing) [5], SPEED (Stateless Protocol for End-to-End Delay) [2], MMSPEED (Multipath Multi SPEED) [3], QEMPAR [6], REAR (Reliable Energy Aware Routing) [12], MBRR (Majority Based Re-Routing) [11], TBRR (Tree Based Reliable Routing) [13] etc. The protocol discussed in this paper is SPEED. SPEED is a real-time QoS routing protocol, but some deficiencies like node failure or congestion.

So in the proposed work, SPEED protocol with fusion of BFO algorithm will be optimized [7,8]. SPEED is a real –instance QoS routing protocol which needs to deliver a data packet to the destination within a certain time period, if the packet cannot be reached within the time period, the packet is dropped back decreasing the performance of speed protocol. Node failure or congestion leads to, large amounts of dropping of the data packets, which may lead to devastating consequences [9].

Remaining paper is organized as Section II will contain the introduction to SNGF, Section III will contain the proposed work, Section IV will contain simulation flowchart, and Section V will contain results and simulation, and finally Section VII will contain the conclusion and future scope.

## II. SGNF STATELESS NON-DETERMINISTIC GEOGRAPHIC FORWARDING(SNGF)

Before elaborating on SGNF, we tend to introduce 3 definitions [10]:

• The Neighbor Set of Node i: NSi is that the set of nodes that ar within the radio vary of node i. Note, we tend to don't assume that the communication radius may be a good circle. SPEED works with irregular radio patterns.

• The Forwarding Candidate Set of Node i: a group of nodes that belong to NSi and ar nearer to the destination. Formally, FSi (Destination)= M – M_next> 0 wherever M is that the distance from node i to the destination and M_next is that the distance from future hop forwarding candidate to the destination. We will simply get FSi (Destination) by scanning the NS set of nodes once.

• Relay Speed. Relay speed is calculated as expressed below:

$$\textbf{SPEED}^{i}_{j}\ (\textbf{Destination}) = \textbf{M-M \_ Next / HopDelay}^{i}_{j}$$

Since in SPEED, nodes keep the Neighbor Set (NS), but don't keep a routing table or flow information, the memory requirements are only proportional to the number of neighbors.

## III. PROPOSED MODEL

In this section, a unique optimized SPEED routing protocol exploitation (Bacterial foraging Optimization) BFO named SPEED-BFO is given. The SPEED-BFO extends the Spatiotemporal period communication SPEED routing protocol by fusion with BFO [11].

SPEED may be a real –time QoS routing protocol that has to deliver a knowledge packet to the destination inside a definite period of time, if the packet cannot be reached inside the period of time, the packet is born back decreasing the performance of speed protocol. Node failure or congestion results in, massive amounts of dropping of the information packets, which can cause devastating consequences. To handle these problems, this work proposes a replacement optimized SPEED protocol just in case of packet dropping by exploitation BFO [12].

Firstly, the network is deployed with a finite variety of detector nodes, at random during a fixed detector space as shown in figure.1. The source and destination nodes are designated at random for information transmission path institution. For the path establishment, nodes below the radio coverage space of supply are found. Forwarding Candidates detector nodes are chosen from the coverage-set space and euclidian distance is calculated between source and destination

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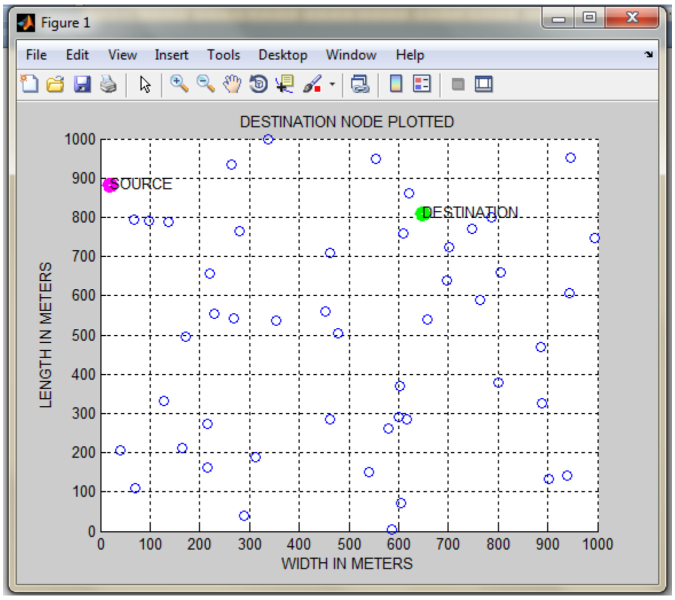


**Figure.1** MANET network with 1000* 1000 meters

If the gap is a smaller amount than the outlined radio vary, the destination lies within the coverage space of detector node and also the packet is transferred on to the destination. If distance is bigger than the radio vary, homeless Non-Deterministic Geographic Forwarding (SNGF) routing algorithmic program is employed for transmission of information packets. If dropping of information packets occur Genetic algorithmic program is initialized with hundred initial population sizes. Every node is tested against the fitness perform to see its goodness. The procedure continues till the fitness criterion isn't meet and destination isn't found.

SNGF is that the routing module liable for selecting future hop candidate which will support the specified delivery speed. NFL and Backpressure Rerouting are 2 modules to cut back or divert traffic once congestion happens, in order that SNGF has obtainable candidates to settle on from. The walk method is provided to support the 3 communication linguistics mentioned before. Delay estimation is that the mechanism by that a node determines whether or not or not congestion has occurred. And beacon exchange provides geographic location of the neighbors in order that SNGF will do geographic primarily based routing. The small print of those parts are mentioned within the resulting sections, severally.

# IV. SIMULATION FLOWCHART

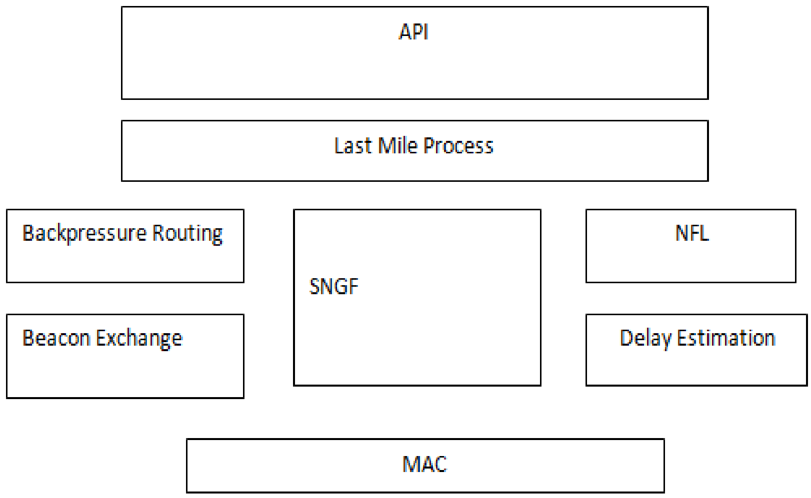


**Figure.2** SPEED Protocol

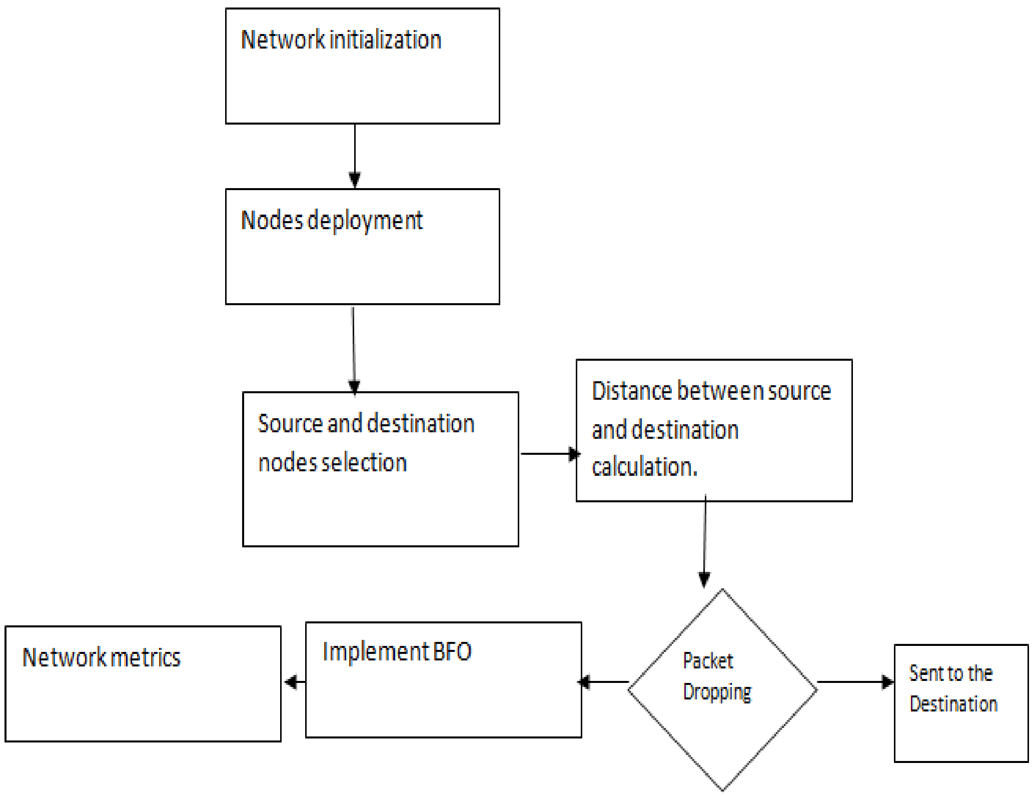

**Figure.3** Proposed Mode

# V. RESULTS AND IMPLEMENTATION

- **Throughput**

Throughput is defined as the number of packets sent properly.

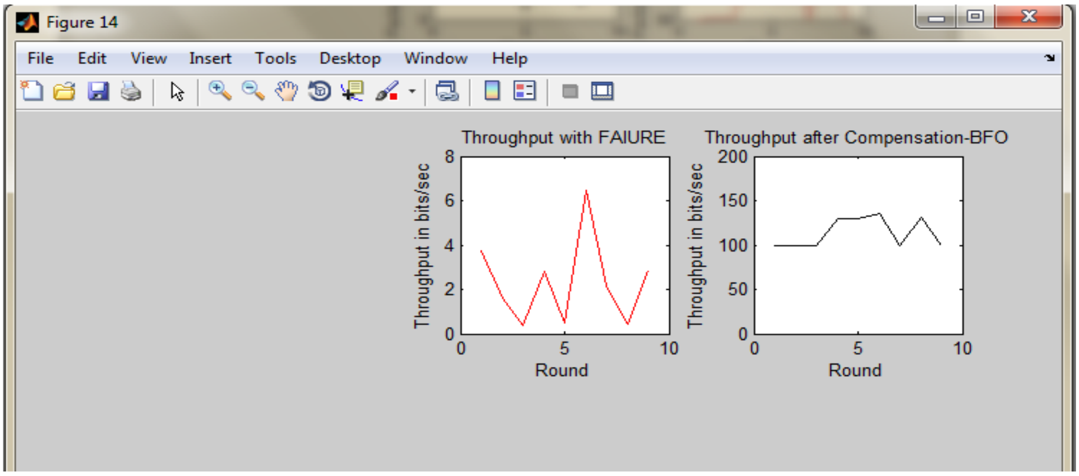


**Figure. 4** Throughput

The above figure shows the throughput between the compensation with BFO and with failure which shows that the throughput with BFO is high as compared to the path failure.

- **End delay**

End-to-End delay is expressed as the time taken to send a packet from source node to destination node.

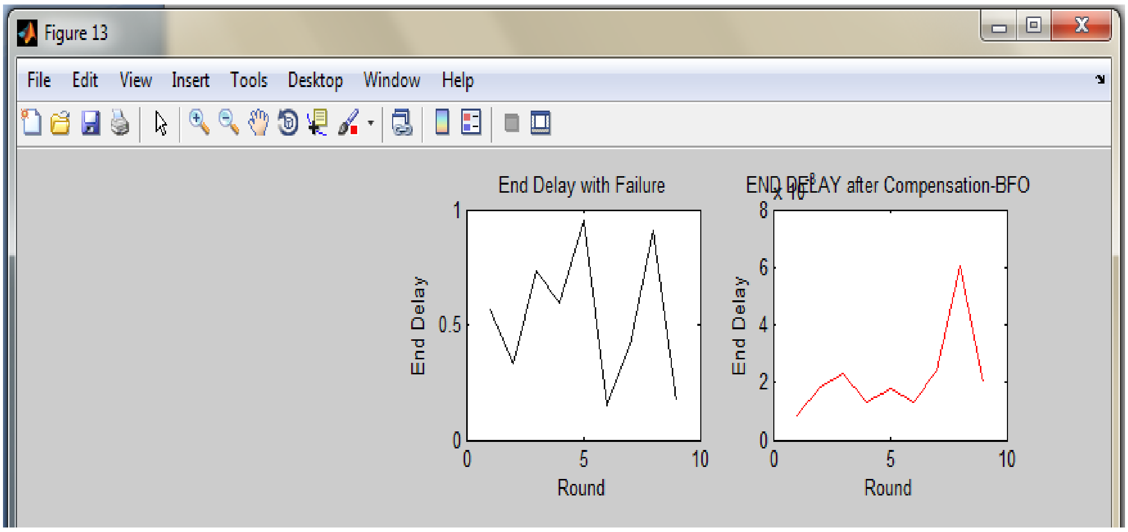


**Figure.5** End Delay

The above figure shows the End Delay between the compensation with BFO and with failure

- **Packet delivery ratio**

It is defined as the ratio total packets sent to total packets received.

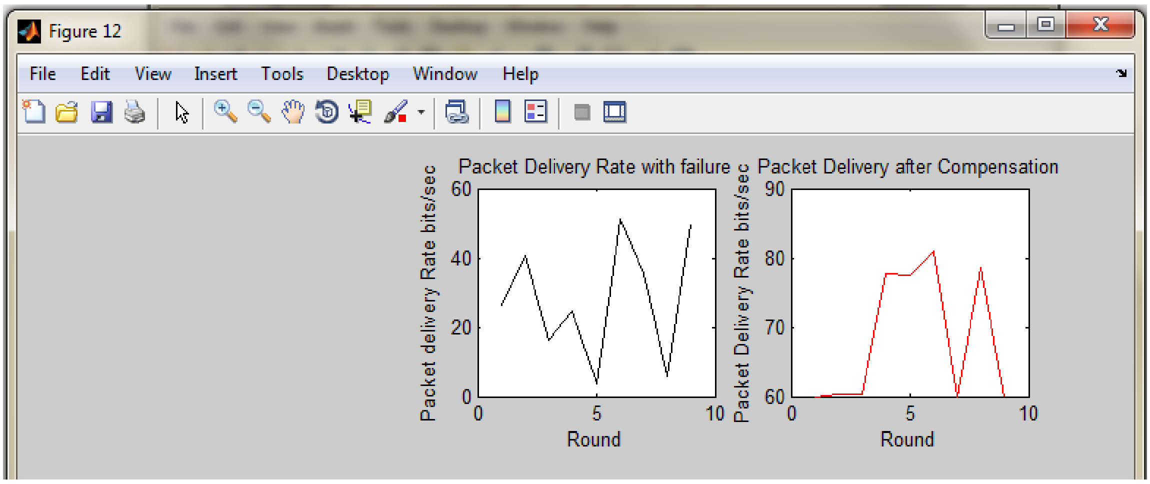


**Figure.6** packet delivery

The above figure shows the packet delivery between the compensation with BFO and with failure

- **Error rate**

The bit error rate (BER) is defined as the percentage of bits having errors in relation to the total number of bits successfully delivered in a transmission.

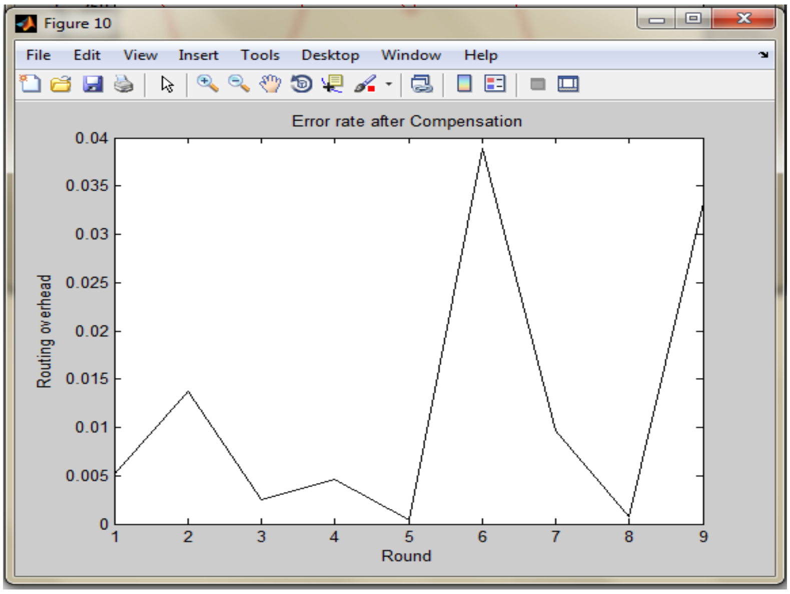


**Figure.7** BER Rate

- **Routing overhead**

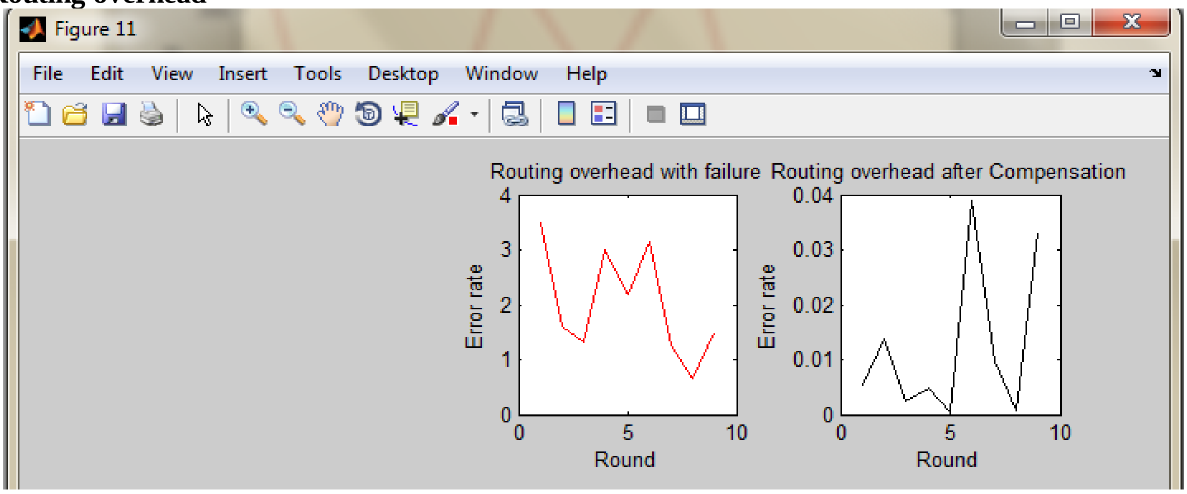


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**Figure.8** routing overhead performance

The above figure shows the routing overhead between the compensation with BFO and with failure

# VI. CONCLUSION AND FUTURE SCOPE

In this work, we presented an overview of the requirements for QoS based routing protocolsand factors that are a challenge in implementing these protocols in a MANET. Through simulation, the performance of the SPEED protocol is evaluated and analyzed with respect to different combinations of network and traffic control parameters. So in the proposed work, SPEED protocol with fusion of BFO algorithm will be optimized. SPEED is a real –instance QoS routing protocol which needs to deliver a data packet to the destination within a certain time period, if the packet cannot be reached within the time period, the packet is dropped back decreasing the performance of speed protocol. Node failure or congestion leads to, large amounts of dropping of the data packets, which may lead to devastating consequences. We have also highlighted the FAR, FRR performances of these protocols.

The highly dynamic nature of a mobile ad hoc network results in frequent and unpredictable changes of network topology, adding difficulty and complexity to routing among the mobile nodes. The challenges and complexities, coupled with the critical importance of routing protocol in establishing communications among mobile nodes, make the routing area the most active research area with the MANET domain.

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