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Enhancing Accuracy Credit Card Fraud Detection using CNN – LSTM Model

Madeshwaran A[1], Logananth.S[2], Faizal.A[2], Dakshanesh.M[2], Deenadhayalan.R[2]

Assistant Professor, Department of Artificial Intelligence and Data Science, Muthayammal Engineering College, Rasipuram, Namakkal, Tamil Nadu, India[1]

UG Scholar, Department of Computer Science and Engineering, Muthayammal College of Engineering, Rasipuram, Namakkal, Tamil Nadu, India[2]

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ABSTRACT: A social network service has representation of each user and range of other services like career services. In social networking, multicast is the process of delivering the information to the recipients. Multicast routing protocols deliver data from source to multiple destinations. Multicast routing is a perfect technology for communication over the large set of social network infrastructure. Multicast provides an efficient data delivery from source to multiple destinations in inter-social network service. The multicast is very successful at providing capable communication system. However, best-effort on data delivery service to large groups is not examined. Our research work helps to optimize the communication path over huge group of elements with multicast scalable secure routing.

KEYWORDS: social network service, Multicast, Multicast routing, data delivery, secure routing

I. INTRODUCTION

With the huge development of the Social Network, an outpouring of information is provided and therefore multi-casting has developed into one of the most significant methods for broadcasting desired information from source node to multiple destination nodes. The method based on multi-casting is the most popular method in the Social Network. The social network elements generate many copies of information based on the topological requirements. The copy creation minimizes the communication overhead in the multicast routing. Multicast routing is a perfect technology for communication over the large set of social network infrastructure. In social network examination, network operator maintains the routing information and network internal features for different type of multi-cast scheduling. The network includes a set of collaborative network information with nonparticipating independent network information.

In social networking, multicast is the delivery of a data or information to a group of recipients concurrently in a single transmission from the sender. Copies are routinely created in other network elements. It decreases sender communication overhead, network bandwidth necessities and the latency observed by receivers. It also creates an ultimate multicast technology for communication between many groups of principals. The optimized task scheduler aims to attain the efficient and effective multicasting on the social network. Also, it reduces the overall schedule length in social networking and provides the effective optimization result while communicating through the multicast routing.

This paper is organized as follows: Section II discusses optimized task scheduler in multicast routing, Section III shows the study and analysis of the existing multicast routing techniques in social network, Section IV identifies the possible comparison between them and Section V concludes the paper, key areas of research is given to optimize the communication path over huge group of elements with multicast scalable secure routing.

II. LITERATURE SURVEY

Existing Topology Inference (TI) algorithms as described in [4] is more flexible on the multiple measurements for attain the enhanced accuracy with faster convergence rate. Sequential TI algorithm significantly reduces the overhead but it is not efficient and effective on multicasting based social network monitoring and application design. Temporally and Spatially Correlated Wireless Channel Coefficients in [1] produce a key by less quantity of feasible sample window. The sample window verifies the channel coefficients in multiple-input multiple-output way but not coupled with the different coding methods while performing multicasting. Energy-Efficient Multicasting as presented in [3]

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construct burst broadcast agendas with less energy consumption. Energy-Efficient Multicasting does not enhance the quality of scheduling experience on the majority of socio network multicast subscribers.

Secure High-Throughput Multicast Routing joins the quantity based detection and accusation based reaction to increases the transmission reliability but fails to have lesser delay advertised value [2]. Multi-Constrained Any-path routing as demonstrated in [5] presents a polynomial time K-approximation algorithm although fails to plan better approximation algorithm with strong hardness result on social networks. Greedy approximation algorithm for computing a Minimum CDS in multi-hop wireless networks communicates with dissimilar ranges [6]. The independent nodes packed with the neighborhood nodes result with critical error while performing multicasting. Robust Tracking (RT) algorithms and reasoning logics as explained in [7] executes the multicast operation on the WiMAX infrastructure. RT algorithm does not provide the effective optimization result while communicating through the multicast routing.

III. MULTICAST ROUTING IN SOCIAL NETWORK COMMUNICATION

Multicast routing protocols sends the data from source to multiple destinations in a multicast group. Multicast routing (MR) is the essential communication network routing methods. It is initially emerged in ARPANET as selective broadcasting from single source node to division of the additional nodes in network. Not similar to unicast routing, MR delivers one data copy from the source node(s) to many destination nodes. As MR is resource effective, it is used in many current communication networks like overlay multicast protocols, wireless networks and satellite networks. The networks used in multicast applications like distributed data processing, internet telephone, interactive multimedia conferencing and real-time video broadcasting.

3.1. Energy-Efficient Multicasting of Scalable Video Streams over WiMAX Networks

Video streaming service over WiMAX networks includes the key entities like content source, WiMAX base station and WiMAX subscribers. Content sources are national TV broadcasters, local broadcasters, Internet TV operations and other video broadcast service providers. Multimedia contents are combined from many sources and send to the WiMAX base station. The WiMAX base station builds a schedule to send out the received data to the subscribers. In the WiMAX physical layer, data are sent out over many carriers in time division duplex (TDD) frames. Each frame has header information and upload/download maps followed by bursts of user data. As video dissemination is estimated as common traffic pattern in future networks, the WiMAX standard describes service called MBS in the MAC layer to broadcast and to multicast. The complete frame is allocated as download-only broadcast frame. An objective of MBS module is to assign video data from multiple streams to the MBS data area in all frames in order that the real-time nature of all video streams is preserved.

An algorithm is designed to choose the subset of scalable video streams and assign in the MBS area. The WiMAX standard described many sleep mode operations to conserve the power for mobile subscribers. To employ the energy conservation methods of sleep mode, the data are sent out in bursts rather than continuous transmission. After receiving a burst of data for small interval of time, receivers go to sleep mode for particular interval of time. When transmission schedule is calculated, the sleep intervals for many streams are inserted in the last frame of burst. At transmission, each mobile subscriber obtains the first burst and identifies its sleep and active intervals. After that, it controls its receiver on or off to collect the relevant frames. The process is repeated for all scheduling window. In next element, burst transmission algorithm is planned to decrease the energy utilization of mobile devices.

3.2. Model-driven Optimization of Opportunistic Routing

Opportunistic routing objective is to improve the wireless results using communication opportunities. There are two factors that establish the results of opportunistic communication in wireless mesh networks. They are: routes and rate limits. Routes establish the benefits of communication opportunities and use of network resources as well as spatial reuse. Rate limits guarantee traffic sources that fail to distribute more than what paths maintain. Rate limiting is important for opportunistic routing because of its utilization of broadcast transmissions. General optimization framework is designed to enhance the routes and rate limits for opportunistic communication. The framework employs opportunistic limitations to probabilistically differentiate the existing communication opportunities. It uses many wireless interference models. A new model called Interference model for IEEE 802.11 broadcast traffic is introduced to collect the dependencies for broadcast transmissions. The model includes only O (E) limitations, where E is total number of edges. As the designed model is non-convex, an iterative optimization procedure is presented to locate a local optimal solution. The designed algorithm is flexible and has many performance ideas. A practical opportunistic

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routing protocol employs the opportunistic routes and rate limits enhanced in real networks. The methods for establishing routes and rate limits hold up both unicast and multicast.

3.3 MAP: Multi-Constrained Anypath Routing in Wireless Mesh Networks

In traditional wireless networks, a packet is delivered to its neighbors with unicast forwarding. In unreliable wireless networks, because of the broadcast manner of the wireless medium, it consumes lesser operation cost for broadcasting a packet to any neighbors than to particular neighbor. In anypath routing, every node transmits a packet to one or more next hop neighbors. When neighbors collects packet, the packet are forwarded is called forwarding set. Forwarding set is same as next hop for each node in classic routing. As many numbers of nodes in forwarding set collects the same packet, redundant forwarding is evaded. To restrain redundant forwarding, the nodes in forwarding set are with priority in transmitting the received packets. Higher priorities are allocated to nodes with lesser distances to destination. A node sends a received packet when all higher priority nodes in similar forwarding set does not collect. An algorithm called MAP calculates s-t anypath in polynomial time.

3.4 Secure High-Throughput Multicast Routing in Wireless Mesh Networks

ODMRP is an on-demand multicast routing protocol for multihop wireless networks that utilizes a mesh of nodes for each multicast group. Nodes are inserted to the mesh by route selection and activation protocol. The source restores the mesh through flooding a JOIN QUERY message in network to revive the membership information and modernize the routes. The name round is used to indicate the gap connecting two consecutive mesh creation results. JOIN QUERY messages are overflowed by a fundamental flood suppression method where nodes process the collected copy of a flooded message. When a receiver node obtains JOIN QUERY message, it turn on the path to the source through training and distribution of a JOIN REPLY message that has entries for all multicast group it requires to connect. Each entry comprises next hop field with equivalent upstream node. While intermediate node collects a JOIN REPLY message, it identifies whether it is on pathway to the source or not through recognition when the next hop field of entries in the message resembles same as its own identifier. It also creates a node part of the mesh and transmits a new JOIN REPLY on similar entries. When the JOIN REPLY messages arrive at the source, the multicast receivers are linked to the source with a mesh of nodes that assures the delivery of multicast data. As node is in FORWARDING GROUP, it retransmits any collected nonduplicate multicast data packets.

IV. COMPARISON OF MULTICAST ROUTING IN SOCIAL NETWORK & SUGGESTIONS

In this section, we demonstrate performance analysis of various multicasting schemes through experiments. In order to compare the multicast routing in social network communication, number of data packets is taken to execute the experiment. Various parameters are used to compare the multicast routing techniques.

4.1 Scheduling Time

Scheduling time is defined as the amount of required to schedule the data packets. It is measured in terms of milliseconds (ms).

$$\text{Scheduling Time } = \text{Starting time} - \text{Ending time of scheduling data packets}$$

Table 4.1 Tabulation for Scheduling Time of Multicast Routing in Social Network

No. of Data Packets (Number)	Scheduling Time (ms)			
	MBS module	Opportunistic Routing	MAP Routing	ODMRP
10	23	36	17	30
20	26	37	19	32
30	29	39	22	35
40	31	42	24	38
50	34	46	26	41
60	39	49	29	44
70	42	51	31	48

The scheduling time comparison takes place on existing Multicast/Broadcast Service (MBS) Module, Opportunistic Routing, Multi-Constrained Anypath Routing (MAP) and On-Demand Multicast Routing Protocol(ODMRP).

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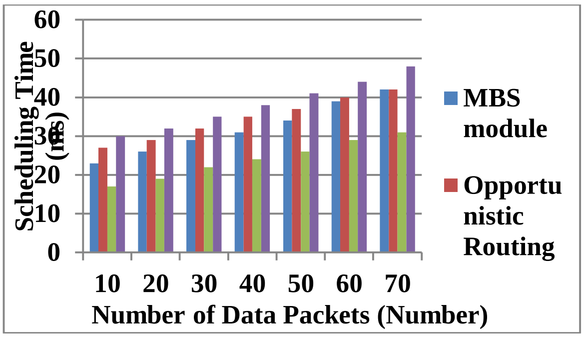

Figure 4.1 Scheduling Time of Multicast Routing in Social Network

Figure 4.1describes the scheduling time on Multicast Routing in Social Network. The experiment shows that Multi-Constrained Anypath Routing (MAP) consumes less scheduling time when compared with Multicast/Broadcast Service (MBS) Module, Opportunistic Routing and On-Demand Multicast Routing Protocol (ODMRP). Multi-Constrained Anypath Routing (MAP) consumes 33.40% lesser scheduling time than Multicast/Broadcast Service (MBS) Module and consumes 45.49% lesser scheduling time than Opportunistic Routing. Multi-Constrained Anypath Routing (MAP) consumes 60.93% lesser scheduling time than On-Demand Multicast Routing Protocol (ODMRP).

4.2 Throughput

Throughput measures the successful data packets delivery over the communication channel and is measured in terms of packets per second (pps).

$$\text{Throughput} = \text{Number of packets sent} - \text{Number of packets delivered}$$

Table 4.2 Tabulation for Throughput of Multicast Routing in Social Network

Number of Data Packets sent (Number)	Throughput (pps)			
	MBS module	Opportunistic Routing	MAP Routing	ODMRP
10	8	7	6	9
20	15	13	11	18
30	23	20	18	25
40	34	32	29	36
50	43	40	38	46
60	52	49	47	55
70	63	58	54	67

The throughput comparison takes place on existing Multicast/Broadcast Service (MBS) Module, Opportunistic Routing, Multi-Constrained Anypath Routing (MAP) and On-Demand Multicast Routing Protocol (ODMRP).

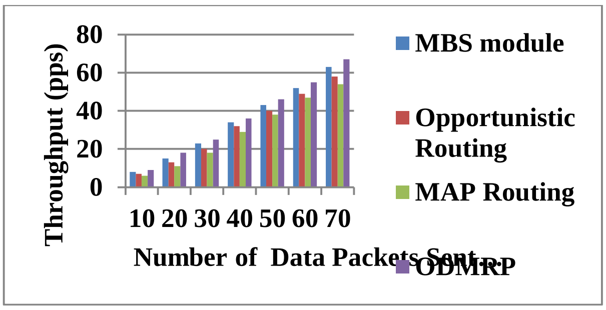

Figure 4.2 Throughput of Multicast Routing in Social Network

Figure 4.2 describes the throughput on Multicast Routing in Social Network. The experiment shows that On-Demand Multicast Routing Protocol (ODMRP) higher throughput when compared with Multicast/Broadcast Service (MBS) Module, Opportunistic Routing and Multi-Constrained Anypath Routing (MAP). On-Demand Multicast

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Routing Protocol (ODMRP) has 8.46% higher throughput than Multicast/Broadcast Service (MBS) Module and 16.92% higher throughput than Opportunistic Routing. On-Demand Multicast Routing Protocol (ODMRP) has 24.42% higher throughput than Multi-Constrained Anypath Routing (MAP).

4.3 Multi-cast Transmission Efficiency

Multi-cast transmission efficiency measures the rate at which the multi-cast transmission is performed. The unit of measurement is percentage (%).

Table 4.3 Tabulation for Transmission Efficiency of Multicast Routing in Social Network

Number of Data Packets sent (Number)	Multi-cast Transmission Efficiency (%)			
	MBS module	Opportunistic Routing	MAP Routing	ODMRP
10	75	52	45	65
20	79	56	48	69
30	83	59	51	72
40	86	63	55	75
50	89	66	58	78
60	92	69	62	82
70	95	72	65	85

The multi-cast transmission efficiency comparison takes place on existing Multicast/Broadcast Service (MBS) Module, Opportunistic Routing, Multi-Constrained Anypath Routing (MAP) and On-Demand Multicast Routing Protocol (ODMRP).

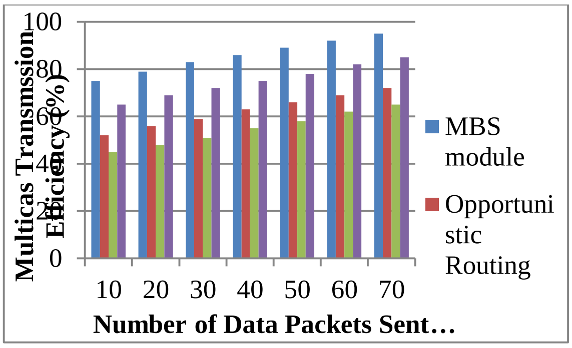

Figure 4.3 Transmission Efficiency of Multicast Routing in Social Network

Figure 4.3 describes the transmission efficiency on Multicast Routing in Social Network. The experiment shows that Multicast/Broadcast Service (MBS) Module higher transmission efficiency when compared with On-Demand Multicast Routing Protocol (ODMRP), Opportunistic Routing and Multi-Constrained Anypath Routing (MAP). Multicast/Broadcast Service (MBS) Module has 12.25% higher transmission efficiency than On-Demand Multicast Routing Protocol (ODMRP) and 27.21% higher transmission efficiency than Opportunistic Routing. Multicast/Broadcast Service (MBS) Module has 36.12% higher transmission efficiency than Multi-Constrained Anypath Routing (MAP).

V. DISCUSSION ON LIMITATION OF MULICASTING ROUTING IN SOCIAL NETWORK

Opportunistic Routing collects the interference between IEEE 802.11 broadcast transmissions. The routing also develops a framework to mutually optimize routes and rate limits for opportunistic communication. Framework utilizes the opportunistic limitations to probabilistically describe the existing communication opportunities. However, fails to extend the robust communication techniques developed in the social networking. Traffic engineering system fail to collect a set of traffic matrices. Convex combination fails to cover the space of common traffic patterns for optimization. Multi-Constrained Any path Routing designs polynomial Time K-approximation algorithm. It also computes an s-t any path in polynomial time. But, the routing fails to design better approximation algorithm. The MAP routing does not establish the stronger hardness result.

In ODMRP, rate guard joins measurement-based detection and accusation-based reaction methods. High-throughput metrics for multicast is also integrated. Though, PDR fails to have a constantly lesser delay advertised value. It is extremely difficult to secure a network where the majority of nodes are insider attackers. MBS module increases the video quality and also minimizes the energy utilization for mobile receivers. Multiple scalable video streams are broadcasted to mobile receivers with inadequate resources. The module designs burst transmission plans to decrease energy consumption lacking sacrificing the video quality. But, the module does not take into account the energy consumption parameters. In addition, it fails to enhance the quality of scheduling experience on the majority of mobile multicast subscribers

5.1 Related Works

Model-driven Optimization (MO) as illustrated in [9] develops a general framework to mutually optimize the routes and time limits for opportunistic communication. MO performs the effective mapping on the practical routing but fails to extend the robust communication in the social networking. XML Multicast Approach as demonstrated in [11] utilizes XML digital signature and encryption models to identify the attached security tokens. Similarity-aware canonicalization approach prior to signature value is not computed in socio network multicast routing. Multipath power-control transmission (MPT) scheme are closely distributed in a 3-D aqueous space to join power control with multipath routing and packet information [10]. MPT multiple copies of the same packet are not sent with multiple communication paths effectively. Adaptive Beamforming System in [8] combines the feedback rate and coherence time for considerable increases of robustness with channel dynamics. Client specific SNR-rate mapping is combined with user scheduling optimization issue however fails to minimize the overall schedule length in wireless LAN.

5.2 Future Direction

The future direction of using the multicast routing in social networks aims in attaining the efficient and effective transmission and reducing the overall schedule length in social networking. In addition, our plan is to provide the effective optimization result while communicating through the multicast routing.

VI. CONCLUSION

Surveillance about the existing multicast routing techniques such as Multicast/Broadcast Service (MBS) Module, On-Demand Multicast Routing Protocol (ODMRP), Opportunistic Routing and Multi-Constrained Anypath Routing (MAP). Comparisons are made to explain the advantages and limitations of different multicasting schemes. The wide range of experiments on existing techniques analyzes the comparative performance of the various multicasts routing in social network and its drawbacks. Finally, from the result, the research work can be done for effective and efficient transmission. In addition, the overall schedule length can be minimized.

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