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Bandwidth-Aware High-Throughput Routing in Multi Hop Wireless Networks with Successive Interference Cancellation

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Abstract: **The more modern networks are bi-directional, also enabling control of sensor activity. Successive Interference Cancellation (SIC) is a new physical layer technique that made the receiver to decode composite signals from multiple transmitters sequentially. Due to the SIC introduction bandwidth of the path can be increased. In this project, the goal is on the design of bandwidth-aware Routing Protocol using SIC technique, at achieving higher overall end-to-end throughput. A routing metric capturing the helps of SIC by means of bandwidth and network resource is proposed, by which our routing protocol can select a path satisfying the bandwidth required for the current flow and reserving more network resource for the subsequent ones.**

I.INTRODUCTION

In cellular and wireless networks, wireless communication happens on the link in between a base station and the receiver. There are numerous intermediate data packets present on a wireless link which receives and forward the information packet. Comparing to the benefits of single wirelesslinks the benefits are more inMulti-hop wireless networks; the multi hop wireless networks will provide an extensive coverage area for a network and also improve communication link. Moreover, transmission of data over multiple short links may require less power for transmission and energy than over long links and these multi-hop networks enhance throughput by the results of higher data rates and better use of wireless medium. Due to Multi-hop wireless networks avoiding of wide cables deployments can achieve a cost-efficiency.

In wireless multi-hop networks, there is no same infrastructure or the centralized control for communicating of nodes with one another using wireless links. Nodes need to be cooperative with each other by forwarding or relaying each others' packets, actually involving various intermediate nodes. Using the medium transmission power multi-hop networks avails nodes that cannot hear each other directly to communicate between intermediate relays. Most of the multi-hop relaying is so promising solution for increasing throughput and providing coverage for a largephysical area. Due to the use of numerous intermediate nodes, the transmission power can be reduced at the sender side thus stopping interference effects and availing spatial reuse of frequency bands.

II. BACKGROUND

In the paper "Interference cancelation for cell frameworks: a contemporary review" the creators depict that Cellular systems today are impedance restricted and just turns out to be progressively so later on because of numerous clients that need to share the range to accomplish high-rate correspondence. In spite of the gigantic measure of scholastic and mechanical research in the previous 20 years on obstruction mindful beneficiaries and the expansive execution upgrades guaranteed by multi-client procedures, today's recipients still by and large regard impedance as foundation commotion. In this article, we list the explanations behind this broad distrust, and examine how present and future patterns expands the requirement for and reasonability of multi-client beneficiaries for both the uplink, where numerous offbeat clients are identified at the same time, and the downlink, where clients are booked and to a great extent orthogonalized. New outcomes for impedance scratching off recipients that utilization regular front closures are appeared to lighten a number of the deficiencies of earlier systems, especially for the testing uplink. This article gives a review of late research on obstruction cancelation and focuses on framework level contemplations for future multi-client beneficiaries.

In the paper titled the creators portray that the execution advantages of two obstruction cancelation techniques, progressive impedance cancelation (SIC) and joint recognition (JD), in remote specially appointed systems re thought about inside the transmission limit structure. SIC unravels and offsets solid meddling signs until the coveted flag is gotten, where as JD alludes to at the same time interpreting the coveted flag and the ones from the interferers. The limits on blackout likelihood are produced from the devices of stochastic geometry as an element of the spatial thickness of interferers. These outcomes demonstrate that SIC performs about equivalent to JD when the flag to-impedance proportion (SIR) edge is short of what one, since SIC is pointless for SIR limits more noteworthy than one, though JD gives a huge blackout advantage regardless of the SIR edge.

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III. ALGORITHMS

A. *HCR Algorithm*

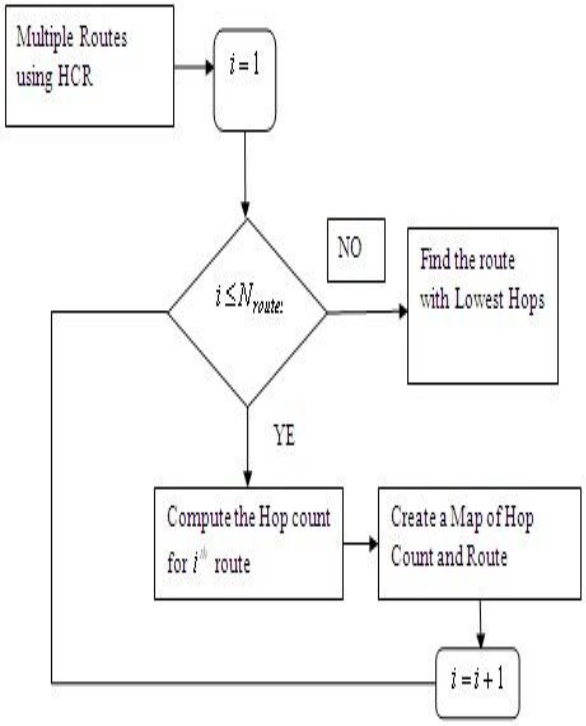

Figure1: HCR Algorithm

In the previous approach namely Hop Count Routing (HCR) all the eligible paths for about 2 neighbor set levels are discovered by using the process of HCR and forwarding. For each of the possible paths the routing metrics especially end to end delay is calculated which is directly proportional to bandwidth. Finally the path which is having the least number of hops is selected to send the packets.

Disadvantages of HCR:

1) Because of discovery of huge number of routes and loss of a lot of control packets complexity will be increased.

2) The energy consumed is very high due to fact that the energy required for transmission and Euclidean distance are directly proportional to energy consumed hence as the number of links are high the energy consumed is high.

B. *BASIC Algorithm*

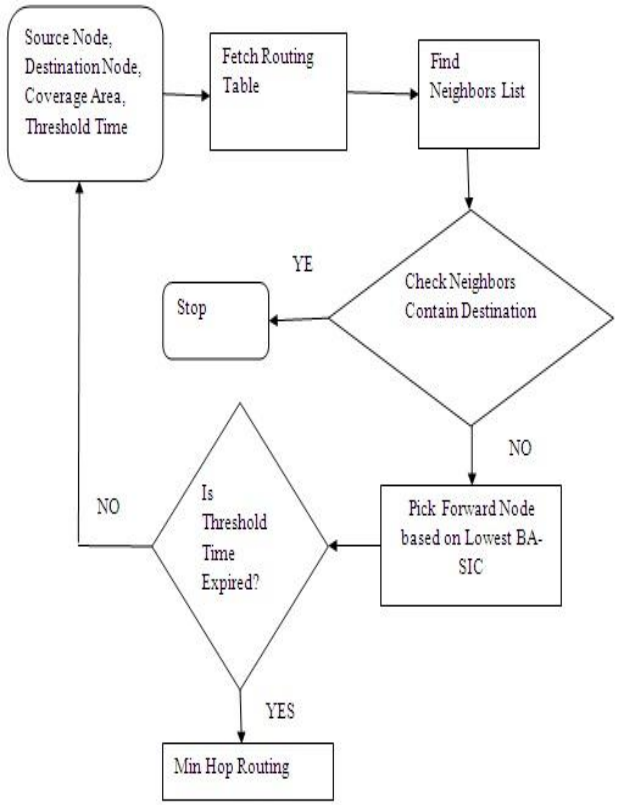

Figure 2: BASIC Algorithm

In this project, Bandwidth Aware Throughput SIC routing algorithm is proposed which adds computation of SIC parameters and if the links satisfies the bandwidth criteria then it is chosen as the next forward link during the routing process. Also the number of routes discovered is drastically reduced.

Advantages of Current Approach:

- There will be less End to End Delay.
- The reduction in the Energy consumption due to the less route discovered and also exchange in the control packets is less.
- The algorithm takes SIC bandwidth criteria in order to pick the forwarding nodes or forwarding link, route chosen is bandwidth aware.

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IV.RESULTS

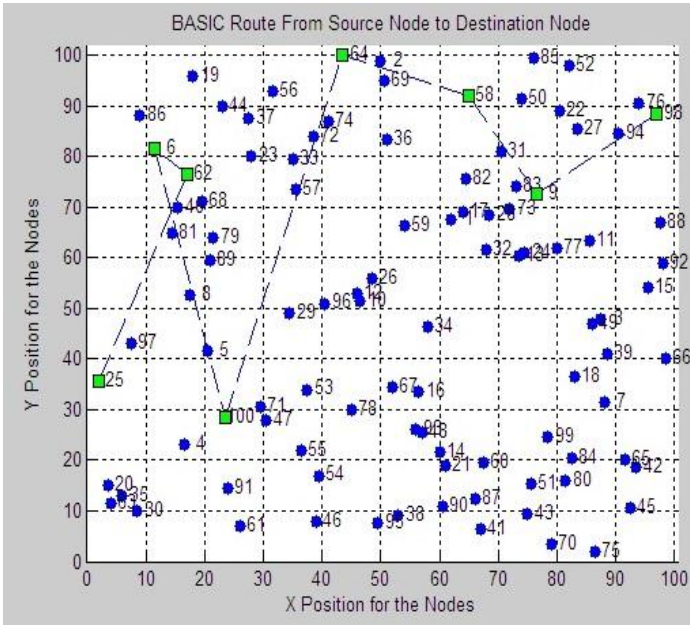

Figure 3: BASIC route from source to destination

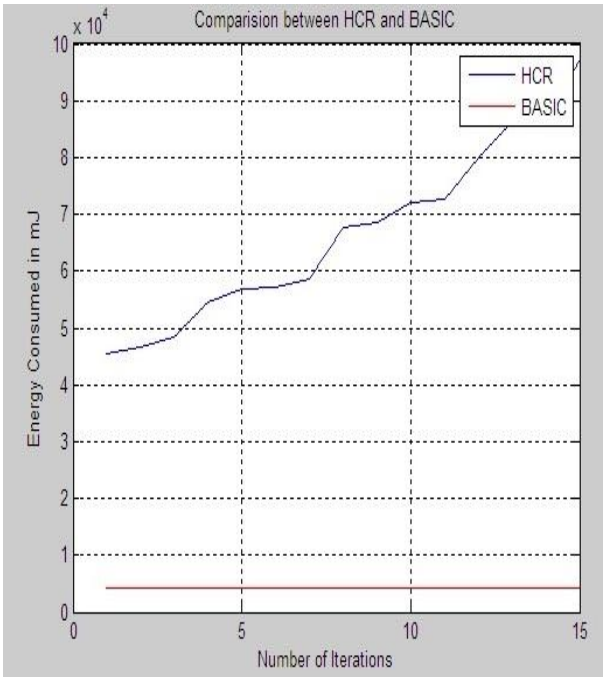

Figure 4: Energy consumed

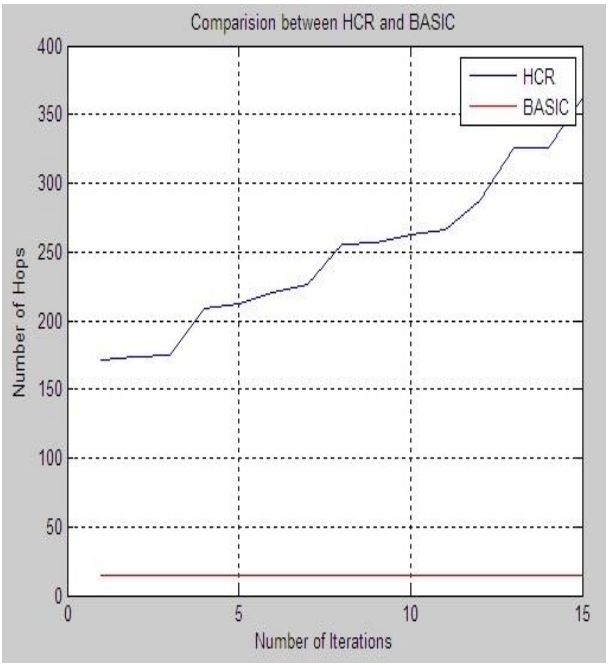

Figure 5: Number of hops

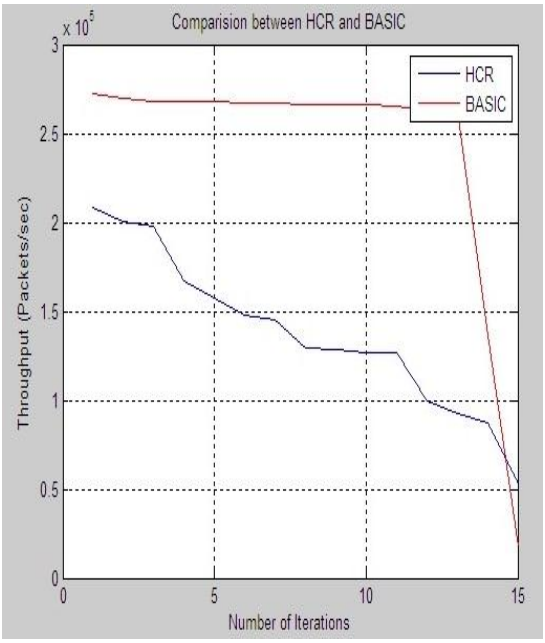

Figure 6: Throughput

Figure 3 shows the route discovered using BASIC algorithm.

Figure 4, 5 and 6 shows the comparison of HCR AND BASIC algorithm in terms of energy consumed, number of hops andthroughput.

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V. CONCLUSION

In this project, we have implemented the routing protocol, called BARS, Bandwidthaware and would Actively explore SIC opportunities for multi-hop wireless networks. Here presented a algorithm to analytically calculate the available bandwidth of a selected path with SIC. We have been designed a distributed heuristic algorithm in order to estimate the bandwidth by using a distributed routing protocol. Then, a routing metric which enhances the benefits of SIC in terms of bandwidth and network. Resource consumption is designed.Simulation results shows that the BARS explores more SIC opportunities, and hence achieves significant throughput gain over other protocols.

VI.REFERENCES

[1] J. Andrews, "Interference cancellation for cellular systems: a contemporary overview," *IEEE Trans. Wireless Commun.*, vol. 12, no. 2, pp.19–29, 2005.

[2] C. Jiang, Y. Shi, Y. Hou, W. Lou, S. Kompella, and S. Midkiff, "Squeezing the most out of interference: An optimization framework for joint interference exploitation and avoidance," in *Proc. IEEE INFOCOM*,Mar. 2012, pp. 424–432.

[3] S. P. Weber, J. Andrews, X. Yang, and G. de Veciana, "Transmission capacity of wireless ad hoc networks with successive interferencecancellation," *IEEE Trans. Inf. Theory*, vol. 53, no. 8, pp. 2799–2814,2007.

[4] J. Blomer and N. Jindal, "Transmission capacity of wireless ad hoc networks: Successive interference cancellation vs. joint detection," in *Proc. IEEE ICC*, June 2009

[5] D. Halperin, T. Anderson, and D. Wetherall, "Taking the sting out of carrier sense: interference cancellation for wireless LANs," in *Proc.ACMMobiCom*, Sept. 2008, pp. 339–350.

[6] S. Lv, W. Zhuang, X. Wang, and X. Zhou, "Scheduling in wireless ad hoc networks with successive interference cancellation," in *Proc. IEEEINFOCOM*, Apr. 2011, pp. 1287–1295.

[7] S. Sen, N. Santhapuri, R. Choudhury, and S. Nelakuditi, "Successive interference cancellation: Carving out mac layer opportunities," *IEEETrans. Mobile Computing*, vol. 12, no. 2, pp. 346–357, 2013

[8] S. Lv, W. Zhuang, M. Xu, X. Wang, C. Liu, and X. Zhou, "Understanding the scheduling performance in wireless networks with successive interference cancellation," *IEEE Trans. Mobile Computing*, vol. 12,no. 8, pp. 1625–1639, 2013.