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An Adaptive Neighbour Knowledge-Based Hybrid Broadcasting for Emergency Communications

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Abstract

In recent years, mobile ad-hoc networks have rooted their pillars for emergency communication owing to reasonable cost, diversity, and easiness of mobile devices. The mobile ad-hoc networks is a self-coordinated, distributed and infrastructure-less network of mobiles nodes. These characteristics of MANET enhanced the applicability of MANET in the field of emergency communication such as military and police operations, flood control and fire disaster management, etc. In MANET, a broadcast storm causes network problems as there are redundant broadcasts and packet collisions. Classical broadcast methods have motivated on evading broadcast storms by preventing some rebroadcasts. The further problem is the link breakages induced by node instability and their power exhaustion. In this research, we propose an adaptive neighbor knowledge-based hybrid broadcasting method to address these network problems. This method refines the counter threshold based on neighbourhood, mobility and energy of the node and makes use of the refined thresholds to make the broadcasting decision. The proposed method perform best as compared to AMECBB and TCBB by decreasing delay, packet dropping, and routing overhead and energy consumption.

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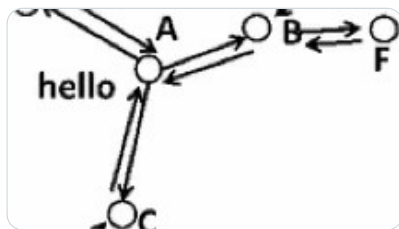| ∨ eBook	EUR 160.49

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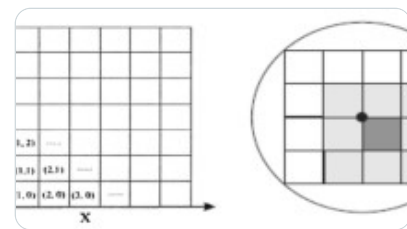Institutional subscriptions →

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References

1. Jyoti Grover, Ashish Jain, N. S. Chaudhari. Ahmed Y. Al-Dubai: Unmanned Aerial Vehicles operated Emergency Ad hoc Networks. In: 7th International Conference on

Communication Systems and Network Technologies. IEEE (2017)

[Google Scholar]

2. Anjum, S.S., Noori, R.M., Anisi, M.H.: Review on MANET based communication for search and rescue operations. Int. J. Wirel. Pers. Commun. 94(1), 31–52 (2017). (Springer)

[Google Scholar]

3. Reina, D.G., Toral, S.L., Barrero, F., Bessis, N., Asimakopoulou, E.: Modelling and assessing ad hoc networks in disaster scenarios. J. Ambient Intell. Humaniz. Comput. 4(5), 571–579 (2013). (idUS)

[Google Scholar]

4. Ni, S.Y., Tseng, Y.C., Chen, Y.S., Sheu, J.P.: The broadcast storm problem in a mobile ad hoc network. In: 5th Annual ACM/IEEE InterNational Conference On Mobile Computing and Networking (MobiCom). ACM (1999)

[Google Scholar]

5. Tseng, Y.C., Ni, S.Y., Shih, E.Y.: Adaptive approaches to relieving broad-cast storms in a wireless multihop mobile ad hoc network. Trans. Comput. 52(5), 545–557 (2013). (IEEE)

[Google Scholar]

6. Fazio, F., Guerriero, F., Fazio, P.: Link stability and energy aware routing protocol in distributed wireless networks. Trans. Parallel Distrib. Syst. 23(4), 713–726 (2012). (IEEE)

[Google Scholar]

7. Cartigny, J., Simplot, D.: Border node retransmission based probabilistic broadcast

protocols in ad-hoc networks. In: 36th Annual Hawaii International Conference on System Sciences (HICSS 03). IEEE (2003)

Google Scholar

8. Scott, D.J., Yasinac, A.: Dynamic probabilistic retransmission in ad hoc networks. In: Proceeding of the International Conference on Wireless Networks (ICWN04). (2004)

Google Scholar

9. Zhang, X.M., Wang, E.B., Xia, J.J., Sung, D.K.: A neighbour coverage-based proba-bilistic rebroadcast for reducing routing overhead in mobile ad-hoc networks. Trans. Mob. Comput 12(3), 424–433 (2013). (IEEE)

Google Scholar

10. Ejmaa, A.M.E., Subramaniam, S., Zukarnain, Z.A., Hanapi, Z.M.: Neighbour-based dynamic connectivity factor routing protocol for mobile ad-hoc network. J. IEEE Access. 4, 8053–8064 (2016). (IEEE)

Google Scholar

11. Ryu, J.P., Kim, M.S., Hwang, S.H., Han, K.J.: An adaptive probabilistic broadcast scheme for adhoc networks. In: Conference on High speed Networks and multimedia communications, pp. 646–654. IEEE (2003)

Google Scholar

12. Jeong, H., Kim, J., Yoo, Y.: Adaptive broadcasting method using neighbor type information in wireless sensor networks. Sensors 11(6), 5952–5967 (2011). (NCBI)

Google Scholar

13. Reina, D.G., Toral, S.L., Jonhson, P., Barrero, F.: Hybrid flooding scheme for mobile ad hoc networks. IEEE Commun. Lett. 17(3), 592–595 (2013). (IEEE)

Google Scholar

14. Wisitpongphan, N., Tonguz, O.K.: Scalable broadcast strategies for ad hoc routing protocols. In: 1st International Symposium on Wireless Pervasive Computing, pp. 1–6. Springer (2006)

Google Scholar

15. Wisitpongphan, N., Tonguz, O.K., Parikh, J.S., Mudalige, P., Bai, F., Sadekar, V.: Broadcast storm mitigation techniques in vehicular ad hoc networks. IEEE Wirel. Commun. 14(6), 84–94 (2007). (IEEE)

Google Scholar

16. Khamayseh, Y., Darwish, O., Wedian, S.: MAAODV mobility aware routing protocols for mobile ad hoc networks. In: Conference on Systems and Networks Communications, IEEE (2009)

Google Scholar

17. Yassein, M.B., Al-hassan, A.A., Taye, Z.A.: Performance analysis of the effects of network density and network mobility on velocity based. In: Conference on Systems, Signals and Devices (SSD), pp. 1–7. IEEE (2010)

Google Scholar

18. Khalaf, D.M.B., Al, A.Y., Abed, M.: New velocity aware probabilistic route discovery methods for MANET. In: 20th Conference on Software, Telecommunications and Computer Network (SoftCOM), pp. 1–6. IEEE (2012)

Google Scholar

19. Shivashankar, H.N., Varaprasad, G., Jayanthi, G.: Model and protocol for energy efficient routing over mobile ad hoc networks. Transact. Emerg. Top. Comput. 2(2), 192–197. (2012). (IEEE)

Google Scholar

20. Zhu, J., Wang, X., Trans. Mob. Comput. 10(11), 1546–1557 (2011). (IEEE)

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