

Blockchain-Enabled Security for Cognitive Radio Networks

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Abstract: This abstract discusses the pressing issue of spectrum scarcity in wireless communication and presents Cognitive Radio (CR) as a promising solution. With the proliferation of wireless applications, the demand for spectrum has intensified, leading to inefficiencies in spectrum allocation. CR technology enables unlicensed secondary users to share licensed spectrum bands with primary users without causing interference, thus optimizing spectrum utilization. This abstract highlights the potential of Cognitive Radio Networks (CRNs) in enhancing communication efficiency and addressing spectrum redundancy. However, it also underscores the limited research on the security aspects of CRNs, emphasizing their vulnerability to attacks compared to wired networks. The abstract introduces a proposed methodology for improving spectrum allocation algorithms, demonstrating superior detection probabilities and maximum interaction times compared to existing algorithms. These findings suggest the effectiveness of the proposed approach in optimizing spectrum utilization and enhancing network performance in CRNs

Keywords: Blockchain, CRN Security, Error Rate, NES Algorithm

REFERENCES

- [1]. Abbas, Sana-e-Zainab, S & Wajahat 2010, 'An Efficient Algorithm for Secure & Fair Dynamic Spectrum Access in Cognitive Radio Networks', Canadian Journal on Multimedia and Wireless Networks, vol. 1, no. 3, pp. 173-177.
- [2]. Amarnathprabhakaran, A & Manikandan, A 2013, 'An Efficient Communication and Security for Cognitive Radio Networks', International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, vol. 2, issue 4, pp. 1689-1696.
- [3]. Anand Z Jin & Subbalakshmi, KP 2008, 'An analytical model for primary user emulation attacks in cognitive radio networks', DySPAN 2008, 3rd IEEE Symposium, IEEE, pp. 1-6.
- [4]. Atta & Alireza 2012, 'A Survey of Security Challenges in Cognitive Radio Networks: Solutions and Future Research Direction', Proceeding of IEEE, pp. 3172-3186.
- [5]. Bhattacharjee, Suchismita & Ningrinla Marchang 2015, 'AttackResistant Trust-Based Weighted Majority Game Rule for Spectrum Sensing in Cognitive Radio Networks', International Conference on Information Systems Security, Springer, pp. 441-460.
- [6]. Bhattacharya, PP, Khandelwal, R, Gera, R & Anjali Agarwal 2011, 'Smart radio Spectrum management for Cognitive radio', International journal of Distributed and parallel systems, vol. 2, no. 4, pp. 12-24.
- [7]. Cabric Danijela M Mishra & Brodersen, RW 2004, 'Implementation issues in spectrum sensing for cognitive radios. Signal Systems and Computers', Conference record of 38th Asilomer Conference, IEEE, vol. 1, pp. 772-776.
- [8]. Chen, R, Park, J & Reed, JH 2008, 'Toward secure distributed spectrum sensing in cognitive radio networks', Communications Magazine, IEEE, vol. 46, no. 4, pp. 50-55.
- [9]. Dubey Rajni, Sanjeev Sharma & Lokesh Chouhan 2012, 'Secure and trusted algorithm for cognitive radio network', Ninth International Conference on Wireless and Optical Communications Networks (WOCN), IEEE, pp. 1-7.
- [10]. Etkin, R, Parekh, A & Tse, D 2005, 'Spectrum sharing for unlicensed bands', Proc. IEEE DySPAN 2005, IEEE, pp. 251-258.

- [11]. FCC 2003, 'Notice for Proposed Rulemaking (NPRM 03-322)', Facilitating Opportunities for flexible, Efficient, and Reliable Spectrum Use Employing Cognitive Radio Technologies. ET Docket, pp. 03- 108.
- [12]. Feng Lin, Robert C Qiu, Zhen Hu, Shujie Hou, Lily Liy, James P Browningz & Michael C Wicks 2012, 'Cognitive Radio Network as Sensors: Low Signal-to-Noise Ratio Collaborative Spectrum Sensing', Proceedings of Aerospace and Electronics Conference (NAECON), IEEE, pp. 978-985.
- [13]. Harish Ganapathy, Constantine Caramanis & Lei Ying 2010, 'Limited Feedback for Cognitive Radio Networks Using Compressed Sensing', IEEE 48th Annual Allerton Conference on Communication, Control, and Computing (Allerton), IEEE, p. 10901097.
- [14]. Haykin & Simon 2005, 'Cognitive radio: brain-empowered wireless Communication. Selected Areas in Communications', IEEE Journalon, vol. 23, no. 2, pp. 201-220.
- [15]. Haykin & Simon 2010, 'Cognitive radio: brain-empowered wireless communications', IEEE Journal of Selected Areas of Communication, vol. 2, pp. 201-220.
- [16]. Ian F Akyildiz, Won-Yeol Lee & Kaushik R Chowdhury 2006, 'Next generation/dynamic spectrum access/cognitive radio wireless networks: a survey', Computer networks, vol. 50, no. 13, pp. 2127- 2159.
- [17]. Januszkiewicz & Lukasz 2010, 'Simplified human body models for interference analysis in the cognitive radio for medical body area networks', 8th International conference on Medical Information and Communication Technology, IEEE, pp. 15-24.
- [18]. Juebo & Long Tang 2012, 'Research and Analysis on Cognitive Radio Network Security', Wireless Sensor Network, vol. 4, pp. 120-126.
- [19]. Khuong Ho-Van & Thiem Do-Dac 2018, 'Reliability-Security Tradeoff analysis of Cognitive Radio Networks with jamming and licensed interference', Wireless Communication and Mobile Computing, Hinadwi, vol. 2018, pp. 1-15.
- [20]. Kwang Cheng Chen, Peng-Yu Chen, Neeli Prasad, Ying-Chang Liang & Sumei Sun 2009, 'Trusted cognitive radio networking. Wireless Communications and Mobile Computing'.
- [21]. León, Olga, Juan Hernández-Serrano & Miguel Soriano 2010, 'Securing cognitive radio networks', International journal of communication systems no. 5, pp. 633-652.
- [22]. León, Olga, Juan Hernández-Serrano & Miguel Soriano 2010, 'Securing cognitive radio networks', International Journal of Communication Systems, vol. 23, issue 5, pp. 633-652.
- [23]. Mao, Huaqing & Li Zhu 2011, 'An investigation on security of cognitive radio networks', International Conference on Management and Service Science (MASS), IEE, pp. 1-4.
- [24]. Matteo Cesana, Francesca Cuomo & Eylem Ekici 2010, 'Routing in cognitive radio networks: Challenges and solutions', Ad Hoc Networks, Elsevier., pp. 18-39.
- [25]. McLoone, Safdar, GA & O'Neillne, M 2009, 'Common Control Channel Security Framework for Cognitive Radio Networks', IEEE 69th, Vehicular Technology Conference, VTC Spring 2009, IEEE, pp. 26-29.
- [26]. Meng, T 2015, 'Spatial Reusability-Aware Routing in Multi-Hop Wireless Networks', IEEE TMC, DOI 10.1109/TC.2015.2417543 .
- [27]. Mitola, J & Maguire, GQ 1999, 'Cognitive Radio: Making software radios more personal', IEEE personal Communications, vol. 6, no. 4 , pp. 13-18.
- [28]. Muhammad Ayzed Mirza, Mudassar Ahmad, Muhammad Asif Habib, Nasir Mahmood, Nadeem Faisal, CM & Usman Ahmad 2018, 'CDSS: Cluster-based distributed cooperative spectrum sensing model against primary user emulation cyber attack', The Journal of Supercomputing, Springer, Available Online, pp. 1-17.
- [29]. Parvin Sazia & Farookh Khadeer Hussain 2012, 'Trust-based security for community-based cognitive radio networks', IEEE 26th International Conference on Advanced Information Networking and Applications, IEEE, pp. 518-525.
- [30]. Parvin, Sazia & Farookh Khadeer Hussain 2011, 'Digital signature based secure communication in cognitive radio networks', Broadband and Wireless Computing, Communication and Applications (BWCCA), IEEE, pp. 230-235.