

Loan Fraud Detection Using Machine Learning Algorithm

Reni Hena Helan R¹, Abirami G², Sultan Saleem A³, Vivekanandan S J⁴, Tejaswini P R⁵

Assistant Professor, Department of Computer Science Engineering^{1,2,3}

Associate Professor, Department of Computer Science Engineering⁴

Students, Department of Computer Science Engineering⁵

Dhanalakshmi College of Engineering, Chennai, India

Abstract: *The widespread usage of the Web has had a massive effect on the growth of online card transactions, especially at the beginning of the previous few years. Because of the increase in internet transactions, the global banking system has been forced to deal with or confront an unexpected number of fraudulent operations. As a reason, rule-based algorithms were created to detect high-risk transactions and allow specialists to authenticate whether or not they were fraudulent. The present intruders used the static nature of rule-based systems as a defensive measure to avoid detection. As a result, researchers set out to develop adaptive fraud detection systems based mostly on machine learning techniques, including deep learning, which is a relatively new application. The widespread use of the Internet, notably at the start of the previous decade, had a considerable impact on the rise in online card transactions. The rise of internet transactions has forced the worldwide banking system to deal with or confront an unexpected amount of fraudulent operations. As a result, rule-based algorithms were developed to identify high-risk transactions and allow specialists to confirm whether they were genuine or not. To avoid detection, the current attackers used the static nature of rule-based systems as a countermeasure. As a result, researchers set out to develop adaptive fraud detection systems based mostly on machine learning techniques, including deep learning, which is a relatively new application.*

Keywords: Fraud detection

REFERENCES

- [1]. RBR. (2018). Global Payment Cards Data and Forecasts to 2023. [Online]. Available: <https://www.rbrlondon.com/research/global-cards/>
- [2]. loss prevention media. (2018). The Latest Credit Card Fraud Statistics and Insights. [Online]. Available: <https://losspreventionmedia.com/creditcard-fraud-statistics-and-insights/>
- [3]. TBB. (2019). Detection and Prevention Methods of Fraud in Banking. [Online]. Available: <https://www.tbb.org.tr/gec/KTPV14.pdf>
- [4]. M. K. Sparrow, License to Steal: How Fraud Bleeds America's HealthCare System. Abingdon, U.K: Routledge, 2019.
- [5]. O. S. Yee, S. Sagadevan, and N. H. A. H. Malim, "Credit card fraud detection using machine learning as data mining technique," J. Telecommun., Electron. Comput. Eng., vol. 10, nos. 1-4, pp. 23-27, 2018.
- [6]. A. Dal Pozzolo, G. Boracchi, O. Caelen, C. Alippi, and G. Bontempi, "Credit card fraud detection: A realistic modeling and a novel learning strategy," IEEE Trans. Neural Netw. Learn. Syst., vol. 29, no. 8, pp. 3784-3797, Aug. 2018.
- [7]. P. H. Tran, K. P. Tran, T. T. Huong, C. Heuchenne, P. HienTran, and T. M. H. Le, "Real time data-driven approaches for credit card fraud detection," in Proc. Int. Conf. E-Business Appl. (ICEBA), 2018, pp. 6-9.
- [8]. A. Roy, J. Sun, R. Mahoney, L. Alonzi, S. Adams, and P. Beling, "Deep learning detecting fraud in credit card transactions," in Proc. Syst. Inf. Eng. Design Symp. (SIEDS), Apr. 2018, pp. 129-134.
- [9]. F. Zhang, G. Liu, Z. Li, C. Yan, and C. Jiang, "GMM-based undersampling and its application for credit card fraud detection," in Proc. Int. Joint Conf. Neural Netw. (IJCNN), Jul. 2019, pp. 1-8.
- [10]. H. Wu and G. Liu, "A hybrid model on learning cross features for transaction fraud detection," in Proc. ICDM,

- 2019, pp. 88–102.
- [11]. L. Zheng, G. Liu, C. Yan, and C. Jiang, “Transaction fraud detection based on total order relation and behavior diversity,” *IEEE Trans. Comput. Social Syst.*, vol. 5, no. 3, pp. 796–806, Sep. 2018.
- [12]. [12] C. Jiang, J. Song, G. Liu, L. Zheng, and W. Luan, “Credit card fraud detection: A novel approach using aggregation strategy and feedback mechanism,” *IEEE Internet Things J.*, vol. 5, no. 5, pp. 3637–3647, Oct. 2018.
- [13]. E. Kim, J. Lee, H. Shin, H. Yang, S. Cho, S.-K. Nam, Y. Song, J.-A. Yoon, and J.-I. Kim, “Champion-challenger analysis for credit card fraud detection: Hybrid ensemble and deep learning,” *Expert Syst. Appl.*, vol. 128, pp. 214–224, Aug. 2019.
- [14]. S. Xuan, G. Liu, Z. Li, L. Zheng, S. Wang, and C. Jiang, “Random forest for credit card fraud detection,” in *Proc. IEEE 15th Int. Conf. Netw., Sens. Control (ICNSC)*, Mar. 2018, pp. 1–6.
- [15]. K. Randhawa, C. K. Loo, M. Seera, C. P. Lim, and A. K. Nandi, “Credit card fraud detection using AdaBoost and majority voting,” *IEEE Access*, vol. 6, pp. 14277–14284, 2018.
- [16]. F. Carcillo, Y. A. Le Borgne, O. Caelen, Y. Kessaci, F. Oblé, and G. Bontempi, “Combining unsupervised and supervised learning in credit card fraud detection,” *Inf. Sci.*, 2019, doi: 10.1016/j.ins.2019.05.042.
- [17]. A. Pumsirirat and L. Yan, “Credit card fraud detection using deep learning based on auto-encoder and restricted Boltzmann machine,” *Int. J. Adv. Comput. Sci. Appl.*, vol. 9, no. 1, pp. 18–25, 2018.
- [18]. F. Carcillo, A. Dal Pozzolo, Y.-A. Le Borgne, O. Caelen, Y. Mazzer, and G. Bontempi, “SCARFF: A scalable framework for streaming credit card fraud detection with spark,” *Inf. Fusion*, vol. 41, pp. 182–194, May 2018. BARIS
- [19]. A. Abdallah, M. A. Maarof, and A. Zainal, “Fraud detection system: A survey,” *J. Netw. Comput. Appl.*, vol. 68, pp. 90–113, Jun. 2016.
- [20]. BARIS CAN , Ali Gokhan Yavuz, Elif M. Karsligil, and M. Amac Guvensan, (Member, IEEE), “A Closer Look Into the Characteristics of Fraudulent Card Transactions”, , date of publication September 7, 2020, date of current version September 22, 2020.