Credit Card Fraud Detection using State-of-the-Art Machine Learning & Deep Learning Algorithms

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Abstract*: Since credit cards are effective & simple towards use, people may use them considering online purchases. Alongside rise in credit card use has come an increase in credit card abuse. Theft about credit cards results in significant financial losses considering cardholders & financial institutions alike. This examination review's principal objective is towards find these fakes, which can be tracked down in accessibility about public information, elegant disparity information, changes in idea about misrepresentation, & a high pace about deception. Among machine learning-based approaches towards credit card recognition certain are discussed in relevant literature are Extreme Learning Method, Decision Tree, Random Forest, Support Vector Machine, Logistic Regression, & XG Boost. Innovative deep learning techniques must still be used, nevertheless, due towards low accuracy. Utilising most recent developments in deep learning algorithms has been main objective. A side-by-side comparison about deep learning & machine learning techniques was done towards achieve effective outcomes. complete empirical examination considering fraud detection is conducted using benchmark dataset considering European cards. dataset was first subjected towards a machine learning technique, which towards some extent improved identification about frauds. towards improve fraud detection performance, three convolutional neural network-based designs are utilised later. addition about additional layers increased detection precision even further. A complete empirical examination was conducted utilising most recent models, altering number about hidden layers, & epochs. AUC Curves with ideal values about 99.9% accuracy, 85.71% f1-score, precision, & 98% accuracy are among improved findings certain are revealed through a review about study work. proposed approach beats state about art AI & profound learning strategies considering Mastercard distinguishing proof issues. We also ran experiments using deep learning techniques & data balance towards reduce number about false positives. gave techniques can successfully distinguish charge card robbery in reality.*

Keywords: Fraud detection, deep learning, machine learning, online fraud, credit card frauds, transaction data analysis

REFERENCES

[1] Y. Abakarim, M. Lahby, & A. Attioui, ''An efficient real time model considering credit card fraud detection based on deep learning,'' in Proc. 12th Int. Conf. Intell. Systems: Theories Appl., Oct. 2018, pp. 1–7, doi: 10.1145/3289402.3289530.

[2] H. Abdi & L. J. Williams, ''Principal component analysis,'' Wiley Interdiscipl. Rev., Comput. Statist., vol. 2, no. 4, pp. 433–459, Jul. 2010, doi: 10.1002/wics.101.

[3] V. Arora, R. S. Leekha, K. Lee, & A. Kataria, ''Facilitating user authorization from imbalanced data logs about credit cards using artificial intelligence,'' Mobile Inf. Syst., vol. 2020, pp. 1–13, Oct. 2020, doi: 10.1155/2020/8885269.

[4] A. O. Balogun, S. Basri, S. J. Abdulkadir, & A. S. Hashim, ''Performance analysis about feature selection methods in software defect prediction: A search method approach,'' Appl. Sci., vol. 9, no. 13, p. 2764, Jul. 2019, doi: 10.3390/app9132764.

[5] B. Bandaranayake, ''Fraud & corruption control at education system level: A case study about Victorian department about education & early childhood development in Australia,'' J. Cases Educ. Leadership, vol. 17, no. 4, pp. 34–53, Dec. 2014, doi: 10.1177/1555458914549669.

[6] J. Błaszczyński, A. T. de Almeida Filho, A. Matuszyk, M. Szelg,, & R. Słowiński, ''Auto loan fraud detection using dominance-based rough set approach versus machine learning methods,'' Expert Syst. Appl., vol. 163, Jan. 2021, Art. no. 113740, doi: 10.1016/j.eswa.2020.113740.

[7] B. Branco, P. Abreu, A. S. Gomes, M. S. C. Almeida, J. T. Ascensão, & P. Bizarro, ''Interleaved sequence RNNs considering fraud detection,'' in Proc. 26th ACM SIGKDD Int. Conf. Knowl. Discovery Data Mining, 2020, pp. 3101–3109, doi: 10.1145/3394486.3403361.

[8] F. Cartella, O. Anunciacao, Y. Funabiki, D. Yamaguchi, T. Akishita, & O. Elshocht, ''Adversarial attacks considering tabular data: Application towards fraud detection & imbalanced data,'' 2021, arXiv:2101.08030.

[9] S. S. Lad, I. Dept. about CSERajarambapu Institute about TechnologyRajaramnagarSangliMaharashtra, & A. C. Adamuthe, ''Malware classification with improved convolutional neural network model,'' Int. J. Comput. Netw. Inf. Secur., vol. 12, no. 6, pp. 30–43, Dec. 2021, doi: 10.5815/ijcnis.2020.06.03.

[10] V. N. Dornadula & S. Geetha, ''Credit card fraud detection using machine learning algorithms,'' Proc. Comput. Sci., vol. 165, pp. 631–641, Jan. 2019, doi: 10.1016/j.procs.2020.01.057.