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ABBES**



mémoire

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Thème

Credit card fraud detection using machine learning

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Abstract

The use of credit cards in financial transactions has brought about changes in global operations. Despite being a cash-based society, Algeria is increasingly embracing digital payment methods. However, the country faces obstacles such as the low level of financial literacy, cultural norms surrounding cash, and limited digital infrastructure in some areas. Although credit cards offer various advantages, they also pose a risk of fraudulent activities. To protect their clients, financial institutions, banks, and businesses have devised methods to detect unusual transactions. To this end, credit cards fraud detection models based on machine learning are being developed to counter illegal activities. In this work, we aimed to comprehensively explore and synthesize various methodologies employed in credit card fraud detection using machine learning. Our objective was to offer a comprehensive overview of the advancements made in this field.

Keywords: Credit card frauds, machine Learning, classification technique, fraud detection.

Résumé

L'utilisation des cartes de crédit dans les transactions financières a engendré des changements dans les opérations mondiales. Malgré le fait que l'Algérie soit une société à base de cash, elle adopte de plus en plus les méthodes de paiement numériques. Cependant, le pays est confronté à des obstacles tels que le faible niveau de littératie financière, les normes culturelles entourant l'argent liquide et l'infrastructure numérique limitée dans certaines régions. Bien que les cartes de crédit offrent divers avantages, elles présentent également un risque d'activités frauduleuses. Pour protéger leurs clients, les institutions financières, les banques et les entreprises ont élaboré des méthodes pour détecter les transactions inhabituelles. Dans notre travail, nous avons essayé d'étudier et de synthétiser différentes approches afin de fournir une vue d'ensemble de ce qui est réalisé dans le domaine de la détection de la fraude par carte de crédit à l'aide de l'apprentissage automatique. Notre objectif était de proposer une vue d'ensemble complète des avancées réalisées dans ce domaine.

Mots-clés: Fraudes par carte de crédit, apprentissage automatique, technique de classification, détection de la fraude.

Acronymes

- **ACFE** : Association of Certified Fraud Examiners
- **AIS** : Artificial Immune Systems
- **ANN** : Artificial Neural Network
- **BBN** : Bayesian Belief Networks
- **CART** : Classification and Regression Trees
- **CNN** : Convolutional Neural Network
- **CNP** : Card not present
- **CVV2** : Card Verification Value 2
- **DT** : Decision Tree
- **ELM** : Extreme Learning Machine
- **FN** : False Negative
- **FP** : False Positive
- **GA** : Genetic Algorithms
- **HMM** : Hidden Markov Models
- **KNN** : K Nearest Neighbors
- **LR** : Logistic Regression
- **MLP** : Multilayer Perceptron
- **ML** : Machine Learning
- **NB** : Naive Bayes
- **NLP** : Natural Language Processing
- **PCA** : Principal Component Analysis

- **RF** : Random Forest
- **REST** : Representational State Transfer
- **SMOTE** : Synthetic Minority Oversampling Technique
- **SOAP** : Simple Object Access Protocol
- **SVM** : Support Vector Machines
- **TPR** : True Positive Rate
- **TN** : True Negative
- **TP** : True Positive
- **TSVM** : Transductive SVM
- **4IR** : Fourth Industrial Revolution