CREDIT CARD FRAUD DETECTION USING CLUSTERING

– Advanced Methods of Data Analysis

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MAIN IDEAS

Financial frauds are a real problem which makes scientists to unite in defending the security of all types of systems. The unprecedented number of fraudulent activities are the result of the growing number of online transactions, often desired by people because it's much easier and they have a sense of comfort.

Understanding the fact that the credit cards payments are the most popular to be attacked by fraudsters, is essential in protecting all the citizens who make transactions daily. In this paper, I show the use of clustering in the detection of these credit card frauds. The first approach was based on the expenditure of the owners, to predict suspicious actions performed. The second approach presented a hybrid method which used the cluster analysis applied on qualitative data.

The first experiment:

- The system job is to offer a high performance and accuracy based on the previous behavioural expenditure of the credit card owners. The experimental results are showing, that the proposed system can reduce the rate of alarms proved false, by studying the relation existent between the activities flagged as real frauds and the activities with a high probability of being fraudulent ones. The logical conclusion, would be that accuracy is served once the system owns the power of reducing the false alarms rate.

The second experiment:

- The second system being more complex, it deals with the problem in another manner. The most important concept would be the data normalization. The experiment is around the investigation of the fraudulent actions involving credit cards transactions. Here, cluster analysis was used to normalize the data. The preliminary results are showing that the Artificial Neural Networks together with the cluster analysis, are offering a way in which the clustering attributes are capable of reducing the neuronal inputs

REASONS

Why should engineers bother to invest time and energy in such projects?

1. The credit card transactions have escalate extensively because of the online shopping, the result of globalization which amplifies the use of internet.

2. There has been a tremendous increase of financial damages on account of electronic payment fraud, with the 7.6 billion dollars in 2010 reaching more than 21.8 billion dollars, five years later; so basically the damages has increased with 300 percents in 2015, related to 2010.

3. The progress of technology is giving us the opportunity and the equipment necessary in conducting attempts of reducing the fraudulent activities.

KEY WORDS

Expenditure behaviour
Clustering Analysis
k-means Clustering
Multilayer Perceptron
Hidden Markov Models