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Credit card fraud detection using machine learning

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Abstract--
Theprimaryemphasisisonidentifyingcreditcardfraudintherealworld.Recentyearshaveseenasharpincreaseinfraudulentactivitiesduetotheamazinggrowthincreditcardtransactions.Theintentistotakesomethingwithoutpayingforitortowithdrawmoneyfromanaccountwithoutauthorization.Inordertoreducetheirlosses,allcreditcardissuinginstitutionsmustnowimplementeffectivefrauddetectionsystems.Thefactthatneitherthecardnorthecardholdermustbepresentwhenthetransactionisbeingmadeisoneofthebusiness'sbiggestobstacles.Duetothis,themerchantisunabletoconfirmwhetherthecustomermakingatransactionisactuallythecardholder.Usingthesuggestedplanandtherandomforestmethod
Keywords: Fraud detection, Credit card, regression, Decision tree, Random Forest

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I.

Introduction: Inordertobuildmodelsinlightofartificialintelligence,informationmining,fuzzyreasoning,andawarenessthathasbeenproducedbyhumans,scientistshavecarriedoutanumberoffakeexercisesinmastercard-trades.

Theissueofmisrepresentation identification is extremely difficult to solve. In order to build the Visa misleading location for our proposed framework, we used AI and the advancement of AI methods. It is well known that using AI to identify extortion is a successful tactic. A lot of information is transferred during online trade activities, and this information may be honest or dishonest. In the fictitious datasets used as instances, highlights are produced. These informational areas, in particular the customer's age and worth

Ⅱ.Objective: Duetotheriseinfraud,whichcostsbusinessesmoneyworldwide,anumberofmethodologiesandtechniquesssshavebeendevelopedtoidentifyfraud.Oneofthesemethodologiesandtechniquesincludesanalysinguseractivitytoidentifyusers'maliciousbehaviour.Delinquency,fraud,infiltration,andaccountdefaultingallfallunderthegeneraldefinitionofmaliciousbehaviour.Thispaperoffersanoverviewofthemethodscurrentlyinuseforidentifyingcreditcardfraud,includinganovelhybridstrategy.intheproject.

Ⅲ. Problem Statement*:*

There are many problems that make this process difficult to execute, but one of the biggest issues with fraud detection is the dearth of real-world data for academic researchers to conduct experiments on, as well as experimental literature that provides real-world findings. The sensitive financial information related to the fraud that must be kept secret in order to protect the privacy of the client is the cause of this.

Ⅳ. Literature Survey

[1]TheCreditCardFraudDetectionusingMachineLearningTechniquesbyJohnO.Awoyemi,AdebayoO.Adetunmbi,SamuelA.OluwadareNaïveBayes,KnearestneighbourandLogistic.Thisisanapplicationofhybridtechniqueofundersamplingandoversamplingiscarriedoutontheskeweddata.

[2]TheCreditCardFraudDetectionusingDataScience andMachinebyS.Pmaniraj.Itisbasedonthedeploymen tofmultipleanamolydetectionalgorithms

[3]TheUseofPredictiveAnalyticsTechnologytoDetec tCreditCardFraudinCanadabyDr.ShaunAghili,Dr.Pa volZavarsky.Thisresearchpaperfocusesonthecreatio nofascorecardfromrelevantevaluationcriteria,feature s,andcapabilitiesofpredictiveanalyticsvendorsolutio nscurrentlybeingusedtodetectcreditcardfraud.

[4]BLAST-SSAHAHybridizationforCreditCardFraudDetection byAmlanKundu,SuvasiniPanigrahi,ShamikSural.Th ispaperproposetousetwo-stagesequencealignmentinwhichaprofileAnalyser(P A)firstdeterminesthesimilarityofanincomingsequenc eoftransactionsonagivencreditcardwiththegenuineca rdholder'spastspendingsequences.

[5]ResearchonCreditCardFraudDetectionModelBas edonDistanceSumbyWen-FangYU,NaWang..Itproposesacreditcardfrauddetect ionmodelusingoutlierdetectionbasedondistancesuma ccordingtotheinfrequencyandunconventionalityoffra udincreditcardtransactiondata,applyingoutlierminin gintocreditcardfrauddetection

[6]FraudulentDetectioninCreditCardSystemUsingS VM&DecisionTreebyVijayshreeB.Nipane**.**Decision tree,Geneticalgorithm,Metalearningstrategy,neuraln etwork,HMMarethepresentedmethodsusedtodetectc reditcardfrauds.Incontemplatesystemforfraudulentd etection,artificialintelligenceconceptofSupportVect orMachine(SVM)&decisiontreeisbeingusedtosolvet heproblem.

[7]SupervisedMachine(SVM)LearningforCreditCar dFraudDetectionbySitarampatel,SunitaGond.Thisth esisproposetheSVM(SupportVectorMachine)based methodwithmultiplekernelinvolvementwhichalsoinc ludesseveralfieldsofuserprofileinsteadofonlyspendin gprofile.Thesimulationresultshowsimprovementin TP(truepositive),TN(truenegative)rate,&alsodecrease stheFP(falsepositive)&FN(falsenegative)rate.

[8]DetectingCreditCardFraudbyDecisionTreesandS upportVectorMachinesbyY.SahinandE.Duman**.**Inthi sstudy,classificationmodelsbasedondecisiontreesand supportvectormachines(SVM)aredevelopedandappli edoncreditcardfrauddetectionproblem.Thisstudyison eofthefirststocomparetheperformanceofSVManddec isiontreemethodsincreditcardfrauddetectionwitharea ldataset

V. PROPOSED SYSTEM :

In the suggested System, the credit card dataset is being classified using a random forest algorithm. An approach for classification and regression is called Random Forest. In a nutshell, it is a group of decision tree classifiers. Making Credit Card Fraud Detection Awards to persons who have been victims of credit card online fraud is the primary goal of our project. To protect our transactions and security, a credit card fraud detection system is essential. With this approach, thieves are prevented from using a stolen or fake card to complete several transactions before the cardholder becomes aware of the theft. Afterwards, a new transaction is evaluated using this model to determine whether it is fraudulent or not. Our goal is to identify

every single fraudulent transaction, while Random forest Many decision trees are randomly created and combined into one "forest" via the Random Forest Algorithm, a supervised learning technique. To increase accuracy, it is preferred to use a variety of decision models rather than relying solely on one learning model. The main distinction between this strategy and the traditional decision tree technique is the random generation of the feature splitting nodes at the root nodes. An N-choice tree is combined to create the random woodland in the first stage of Random Forest's operation, and then expectations are created for each tree created in the first step. The steps and graph below can help you understand how the system works.

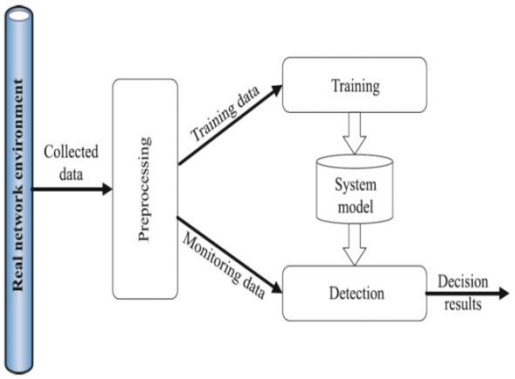

Fig1proposedmethodworkflow

Ⅵ Implementation and Result:

Step1: First, choose the relevant irregular K data from the training set.
Step 2: Createchoicetreesbasedontheselectedinterestingdata (Subsets).
Step3:choosenfortheoptiontreesyouneedtoconstructi n
Step4:Repeatingofstages1and2

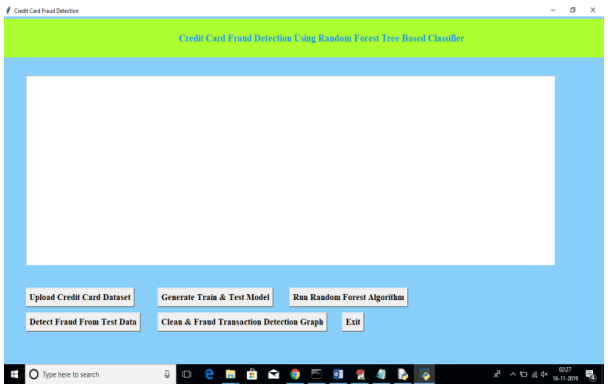

Fig2UI for detection

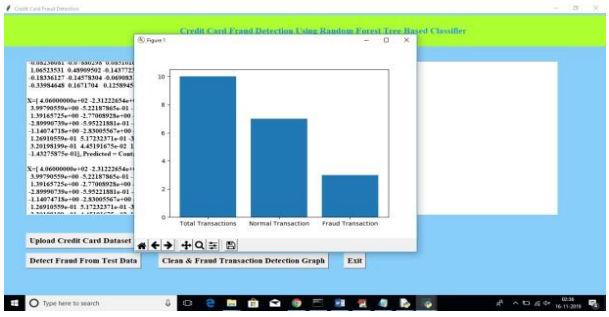

Fig3detectiongraphoffraudtransactions

Inabovegraphwecanseetotaltestdataandnumberofnormalandfraudtransactiondetected.Inabovegraphx-axisrepresentstypeandy-axisrepresentscountofcleanandfraudtransaction

Ⅶ Conclusion:

The Random Forest algorithm will perform better with a larger number of training data, but speed during testing and application will suffer. Application of more pre-processing techniques would also help. The SVM algorithm still suffers from the imbalanced dataset problem and requires more pre-processing to give better results at the results shown by SVM is great but it could have been better if more reprocessing have been done on the data.

Ⅷ Future Enhancement:

Although though we fell short of our objective of 100% accuracy in fraud detection, we did manage to develop a system that, given enough time and data, can come very near to that objective. There is some potential for improvement here, as with any effort of this nature.Due to the nature of the project, it is possible to integrate many algorithms as modules and combine their outputs to improve the final result's accuracy.

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