

Abstract

With the fast development of economy, credit cards are more popular in commercial transactions. Credit card fraud emerges when someone uses other persons’ card without the knowledge of the card holder. Machine learning and artificial intelligence approaches have been suggested to defeat these problems. The method we used to detect fraud is genetic algorithm. The main goal of the genetic algorithm is to get the better solution to remove the fraud.

Problem Definition

Credit card fraud emerges when someone uses other persons’ card without the knowledge of the card holder. Credit card contains a unique card number and the security of the credit card depends on the privacy of the credit card number which is confidential.

The Credit Card Frauds have various Techniques like lost Or Stolen Card, rigging card fraud, free Wi-Fi trap and fake call or email . Fraud detection problem is a classification problem, in which some of statistical methods, many data mining algorithms have proposed to solve it.

One of the problems surrounding credit card fraud is the ambivalence of the consumer .A \$70 fee may be incurred. Many criminals can simply use the number to apply for a new credit card that.is attached to the consumer’s name, although they would know about that.

The detection of this problem is very difficult to implement in practice because there is not enough information available that provides experimental results on the real-world because the financial data which is sensitive is related with the fraud that has to be kept confidential for the purpose of customers’ privacy.

To achieve good results, Fraud detection system should be able to handle skewed distribution, because a very small percentage of all credit card is fraudulent, There should be a way to handle noise to refer to the error present in the data and the system should be able to end and minimize False alarm or mistakes.



Some methods of solution

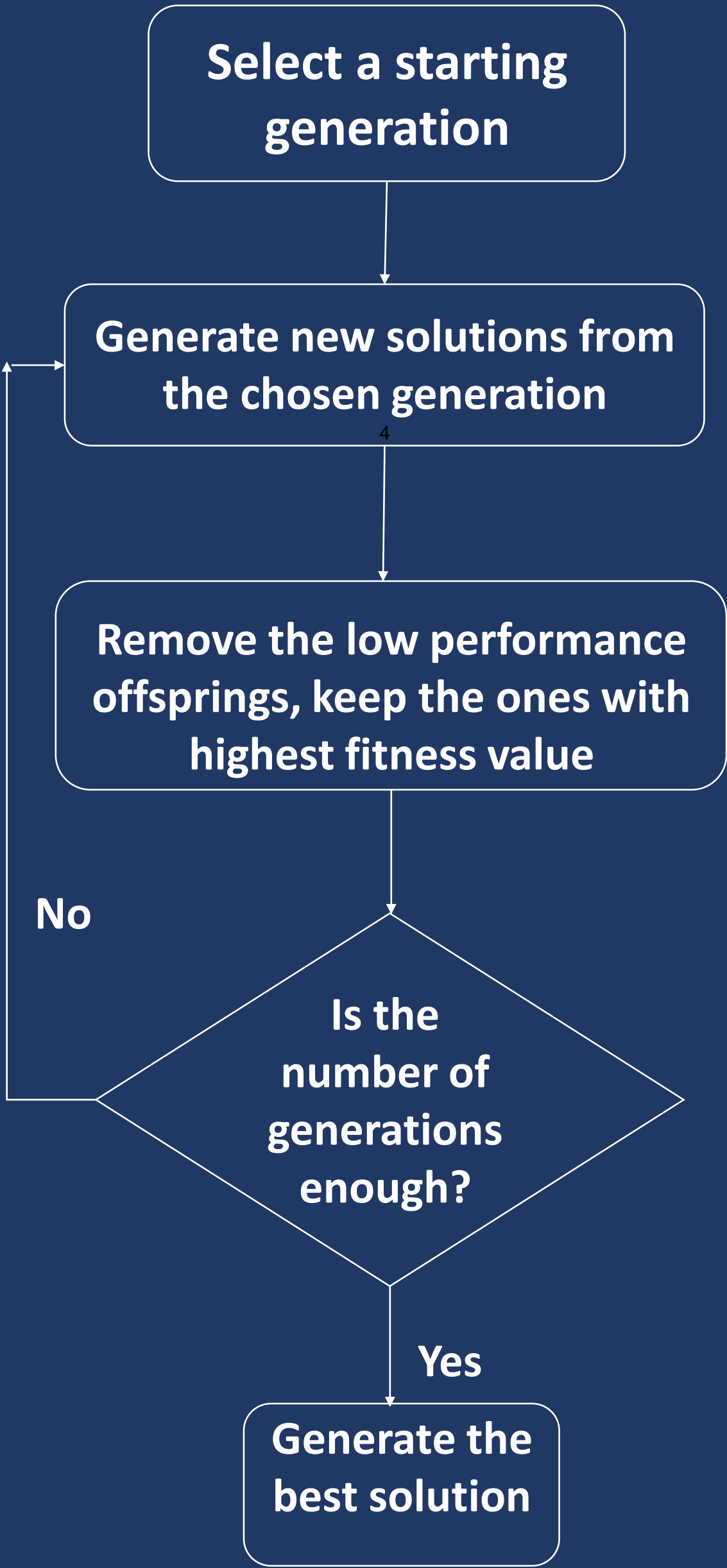
Method	Advantage	Disadvantage
ANN	lack of need to be reprogrammed	poor explanation capability
Bayesian network	high accuracy	expensive
HMM	Fast in detection	low accuracy
Genetic algorithm	Works well with noisy data /fast in detection	Requires extensive knowledge to set up & operate & difficult to understand.

Data Description

After calculating a few variables based on information of the card holders and their transactions, we generate the data set that we will load into the code.
Below is a sample of data set we used to generate our results.

CardID	Auth	Cur.BB	CU	Avg.BB	OD	CCAge	CUT	Loc	LocT	ODT	AmtT
11111	111	20000	13	60000	4	125	0	3	0	0	0
11112	112	25000	40	55000	20	264	6	4	2	0	9000
11113	113	15000	21	45000	3	111	2	10	2	1	15000

Genetic Algorithm

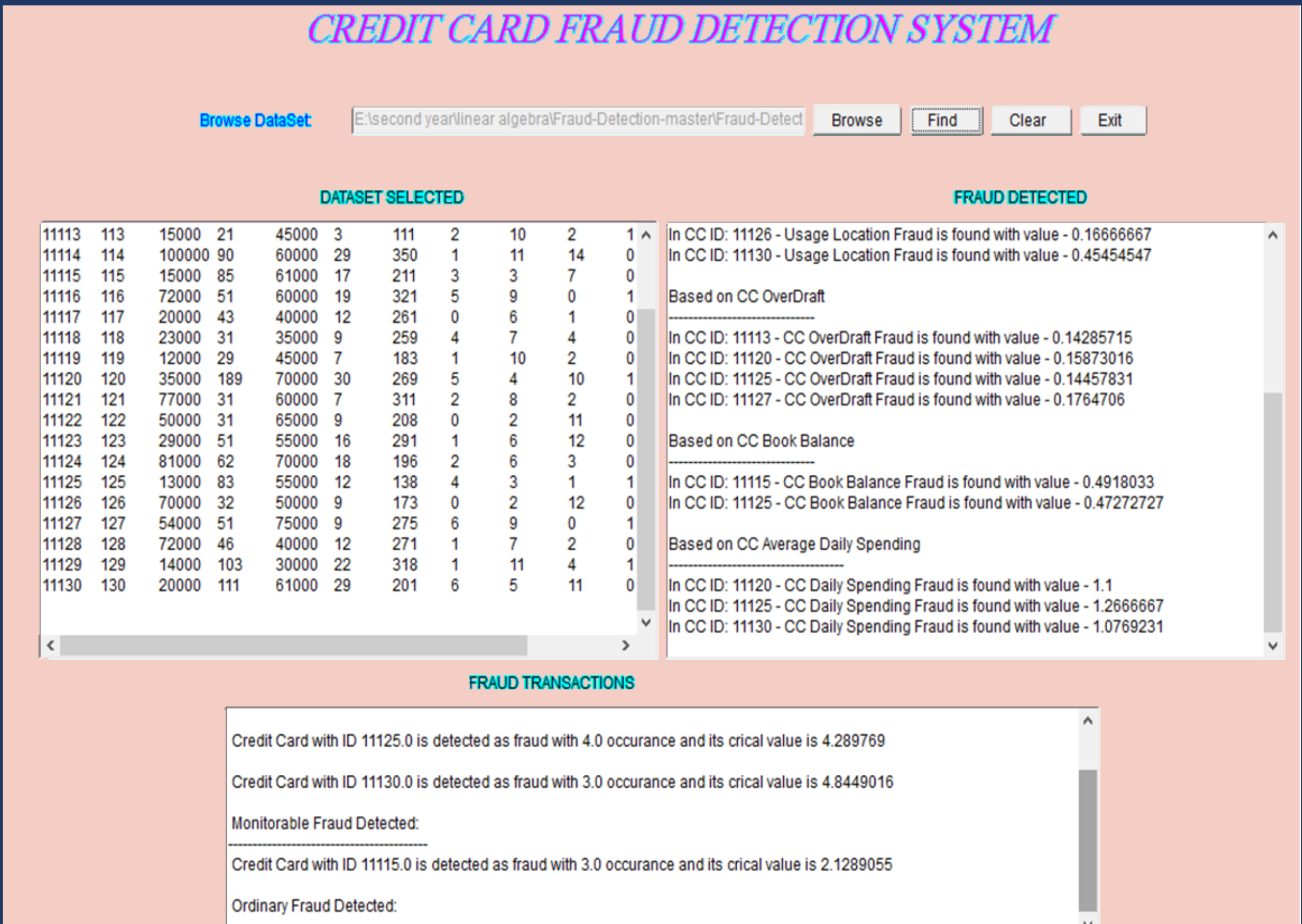


```
BasicGeneticAlgorithm ( ) {
    Initialize population;
    Evaluate population;
```

```
While (termination criteria not met)
{
    Select solutions for next generation;
    Perform crossover and mutation;
    Evaluate population; }
//end of algorithm.
```

Analysis and Results

After generating the **data set**, we now load it into the code which will perform some steps and generate the results, we used **ECLIPSE** to run the code which is written in Java. We converted other types of data sets into ones that match our code.
Below is the interface that shows the results:



Conclusion and future work :

Genetic algorithm can be used for obtaining optimized solutions to search problems using the theory of natural selection, they are best used for searching through large and complex data sets like the data sets related to credit card frauds. Genetic algorithms have survived for over 40 years, and they are still go-to algorithms in engineering and optimization problems. New developments and extensions of genetic algorithms (such as quantum-inspired genetic algorithms, or QIGA) are gaining ground these days and are expected to continue being refined and explored to improve compute times and accuracy. QIGA is an interesting avenue of research, and has potential to solve some of the downsides of genetic algorithms.