Credit Card Fraud Detection Ai Layer

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Objective

According to a Forbes article, Artificial Intelligence is projected to add 15 trillion dollars to the world economy. I had also mentioned a similar trillion dollar valuation, in 2018, in a gleaner article.

This project seeks to supplement current Fraud Guard method with neural network based code/method that I prepared/wrote, for the goal/purpose of improved fraud detection by > 50%, with estimated savings of up to 37 million jmd globally.

The current method of fraud detection though well structured, could be enhanced/supplemented by additional automatic means of credit card fraud detection, namely via the use of artificial intelligence. Artificial neural networks are quite general; there are neural networks that enable self-driving cars, while the same neural network types also enable disease diagnosis, language translation etc.

The history of Ai has seen where expert systems with years of hand crafted rules/knowledge by experts, are enhanced considerably by automated systems that learn how to build rules. In some cases, hybrid systems have been constructed that make use of both learning ai, and rule-based ai.

Nowadays, most modern systems, including ones that other banks are using, make great use of the second wave of ai, namely statistical learning, or machine learning. The goal is to utilize the second wave of Ai, in tandem with current fraud guard systems, to greatly increase detection of frauds, while reducing the number of false positive detection.

As the bank gets more complex, we'll reasonably need to use neural networks or some similar method to do fraud detection, because it is already hard for rule builders to keep up with fraud patterns with the current non-neural network based method, and neural network or similar methods capture more frauds, and minimizes the amount of transactions that are falsely detected as fraudulent, by up to 54%.

Tsys (current standard): In fact, while some banks utilize an older instance of Tsys, by contrast, Tsys' latest Fico Fraud Management system utilizes artificial neural networks!

- The Fico system seems different from the apparently non-neural network based FraudGuard system that some banks currently employ.. I propose that Jamaican banks shall either seek to acquire Fico Fraud Management licensing, or integrate a neural net based pipeline, using the credit card artificial neural network code prepared by myself that this document refers to or similar.

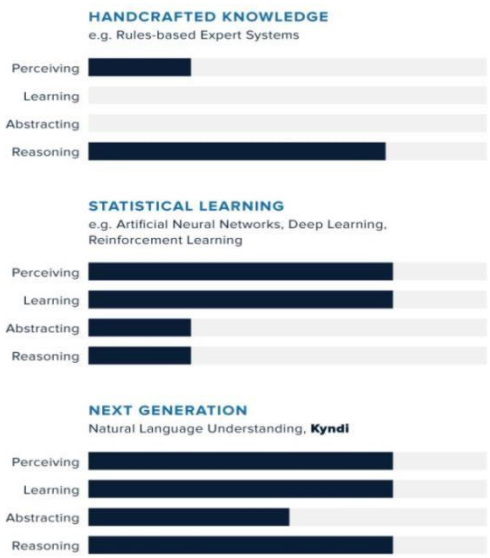


Figure taken from https://kyndi.com/blog/the-waves-of-ai/. See also https://www.sharper.ai/taxonomy-ai/.

Credit Card Fraud Detection Neural Network Pipeline (CCFDNN Pipeline)

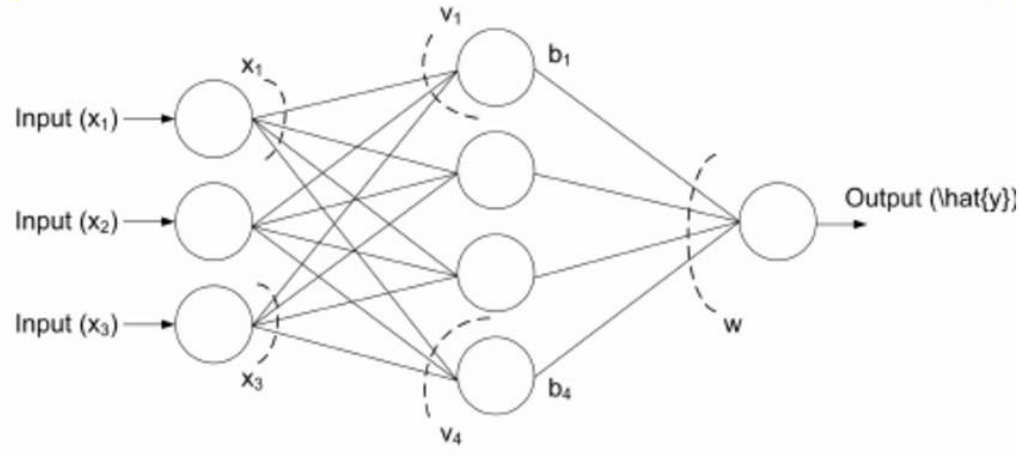
The architecture of the neural network is a somewhat simple one that uses Google Tensorflow; a 3 layer neural network model that takes as input PCI compliant fields pertaining to a transaction record, and returns as output, a fraudulent or non-fraudulent transaction prediction. Source code is attached as: "**god_ai_credit-card-fraud-**

detection.zip". Run "god_ai_credit-card-fraud-detection_load_pretrained.py".

an example transaction record

472	-3.04354	-3.15731	1.088463	2.288644	1.359805	-1.06482	0.325574	-0.06779	-0.27095	-0.83859	-0.41458	-0.50314

A 3 layer artificial neural network model, that accepts transaction records



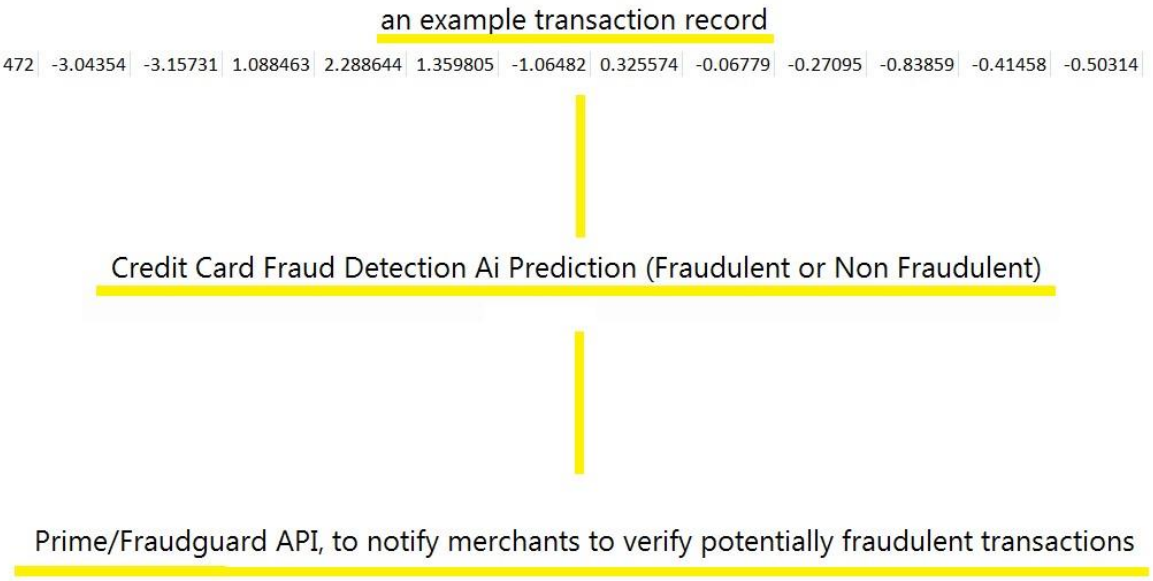
A prediction, fraudulent or non-fraudulent

Credit Card Fraud Detection Ai Layer Phase 1 Pipeline

Preliminary phase does a demo/trial run on Bank dev transaction data.

The phase 1 pipeline makes use of Prime and Fraudguard API, to contact/notify merchants/customers of potential frauds detected by (CCFDNN) CreditCardFraudDetectionNeuralNetwork/Ai.

Phase 2 concerns the use of Prime and Fraudguard APIs, to perk cards and flag cards as potentially fraudulent, i.e. cases to be analyzed by fraud team.



Preliminary Results

Upon tests on 300k Bank database development transactions, my artificial neural network project performs okay at 95% accuracy. Moving forward, a pilot program will be carried out to test the system in real time.

Future work

A more intuitive user interface will be constructed to get answers regarding batch transactions and or individual transactions, beyond the current demonstration user interface. More data will be used to train the neural network.