

# **Credit Card Fraud Detection**

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## **Introduction**

Credit card fraud is a wide-ranging term for theft and fraud committed using or involving a payment card, such as a credit card or debit card, as a fraudulent source of funds in a transaction. A wide variety of card scams exist, including the dumping of card numbers, skimming, phishing, and card not present fraud. The most frequent payment method identified out of all fraud reports was credit cards, and from 2019 to 2020 credit card fraud grew by 44.7%, showing a steady rate of increase in this issue. We also want to delve deeper into a type of fraud that is becoming more and more common, online payment fraud. Learning how online shopping and transactions contribute to credit card fraud can possibly aid in earlier detection and prevention. Online shopping fraud statistics show that global losses from payment fraud reached \$32.39 in 2020 – a number triple that of reports in 2011. And as time goes by, fraudsters and people with malicious intent try to take advantage of unknowing people online.

## **Motivation and Problem**

Fraudulent transactions are a huge problem for individuals, companies, and banks. Fraudulent transactions can be a financial drain on a bank and can also cause a lot of stress and inconvenience for the customer. For one of our group members personally, fraudulent transactions have been a problem in the past and have caused a lot of stress and inconvenience. We hope that by completing this project we might be able to help prevent fraudulent transactions and help people to feel less stressed about their transactions. We've learned that timely detection

of these fraudulent transactions can help reduce the financial loss and stress caused by them. Scammers continue to attempt these attacks because they are profitable, and as they become more profitable, their efforts will increase. However, that also means that when these attacks become less profitable, their efforts will decline as they are no longer making money. We know that in recent years the frequency of these attacks as well as the amount of money lost to them has increased, and over the pandemic has more than doubled. Thus preventing these sorts of attacks will not only make them less effective, but also less common, since attackers will have less expected profit from doing them and thus less motivation to carry them out.

Since online transactions are increasing in rate, and so is fraud, banks need some automated way to detect fraud and block those transactions, as doing so manually is becoming increasingly infeasible. In addition, “According to estimates, e-commerce losses to online payment fraud were estimated at 20 billion U.S. dollars globally in 2021,” according to [this article](#). Preventing even 5% of these transactions would save over a billion dollars. The problem we are attempting to solve is this: given transaction data that would readily be available to a bank, classify any type of transaction into two categories: legitimate, or fraudulent.

### **Goals and objectives:**

The primary goal of this project would be to build an effective classifier to detect fraudulent transactions. This could then be used by a bank to automatically detect fraud, and potentially block fraudulent transactions or at a minimum flag them for manual review, to prevent unrecoverable fraudulent transactions. A secondary goal would be by examining the data, we might be able to learn more about how scammers are able to pull off these fraudulent attacks and

what we can do to prevent them. This, however, would be an incidental secondary goal, and will not be the main focus of the project. In designing and implementing a classifier, we would compare various classification algorithms, including their accuracies, precisions, and other metrics. In doing so, we may be able to identify the best method for credit card fraud detection.

## **Data**

<https://www.kaggle.com/datasets/dhanushnarayananr/credit-card-fraud>

## **References**

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