



# SBT FINTECH MONTHLY NEWSLETTER

## Editor's Note

BY DR. ABENA PRIMO

Dear Reader,

This week I have the pleasure of introducing you to Dr. Deepti Gupta who is the author of this month's article.

Dr. Gupta is a new faculty member in the Computer Science Department here at Huston-Tillotson University. She is a computer security researcher with extensive work on securing medical devices. In this article, she tackles fraud in the financial industry.

I hope you enjoy this article that proposes a new method of fraud detection with blockchain.

Best wishes,

Dr. Abena Primo  
Associate Professor of Computer Science at  
Huston-Tillotson University

**SBT**

### Newsletter Highlights

A FAIR BLOCKCHAIN APPROACH FOR FINANCIAL FRAUD DETECTION

---

[CLICK HERE FOR LAST SEMESTER'S BLOCKCHAIN NEWSLETTER](#)

---

[VIEW SBT BLOCKCHAIN EVENT REPLAY HERE](#)

---

[VIEW SBT FINTECH EVENT REPLAY HERE](#)





# A Fair Blockchain Approach for Financial Fraud Detection

BY DEEPTI GUPTA, PH.D

## ABSTRACT:

By 2019, the growth of online banking had reached \$11.43 billion, and is projected to reach \$31.81 billion by 2027. Due to tremendous growth of online banking, it faces several challenges such as fraud, uncertainty and security concerns. The Fraud Detection approach is a method, where it identifies any rare activities to prevent money from malicious users. Fraud detection is applied to many industries such as online banking and insurance companies, etcetera. In banking, fraud activities could include unauthorized access, forging checks, and using stolen credit cards. Currently, various approaches including Machine Learning (ML), Artificial Intelligence (AI), Cloud Computing, and Blockchain have all been used to develop a robust Fraud Detection Model. In this article, I will present how Blockchain enhances the accuracy of a Fraud Detection Model.

## INTRODUCTION:

The investigation of fraud in the



industry domains, such as online banking, insurance, and healthcare, have completed by using innovative technologies. Machine Learning (ML) based Fraud Detection Models are dominating the industry. ML based models always require Big Data (this term refers to large amounts of data) to develop a robust Fraud Detection Model. However, ML based Fraud Detection Models face several challenges. In current scenarios, customer financial records are protected by law and internal policies, therefore, this Big Data

cannot be used to develop the Fraud Detection Models. This article presents how Blockchain Technology is able to identify fraudulent users and a permissioned blockchain byzantine fault tolerant protocol can help identify user behavior.







# A Fair Blockchain Approach Continued

## FINANCIAL USE CASES:

An online banking system is considered as an entity, which has different types of users. These users include customers, cashiers, managers, and banks. There are many activities in these systems such as updating balances, checking interest, checking salary, and transferring money. Any entity can behave as a rational user to increase its utility, which can be considered as fraudulent. Rational entities are the ones which will deviate from suggested protocol if they think following a different protocol will result in a higher benefit.

## A FAIR BLOCKCHAIN BASED SOLUTION:

This approach will be based on Game Theory, where I consider that the entities are the players (e.g., a bank, healthcare system) jointly attempting to agree on a shared ledger of financial transactions. Where each player wants to increase its benefits, it will have its own transactions. Later, they are merged in the shared ledger. After merging in the shared ledger, each entity receives fees or incentives to encourage other



participants. To reduce the number of rational users, a fair based Blockchain protocol is applied, giving incentives based on their participation.

byzantine fault tolerant protocol ensures that any rational user cannot take advantage of others.

## CONCLUSION:

In the current era, blockchain technology is adapted widely in various domains including finance, banking, manufacturing, and technology. It also shows promising results to secure these environments. The main component of a blockchain is a distributed shared ledger protocol. A permissioned blockchain

