

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Final Year Project

PROGRESS DIARY

(BCS-753)

Bitsecure: Hybrid Detection Model For Bitcoin Fraud

Divyansh Saxena, 2201640100144
Deepali Sachan, 22016401000126
Aseem Pradhan, 2201640100091
Aryan Katiyar, 2201640100087
Asmita Chaurasia, 2201640100099

Project Id: 26_CS_4C_04

Dr. Rohit Saxena
Associate Professor

Department Vision Statement

To be a recognized Department of Computer Science & Engineering that produces versatile computer engineers, capable of adapting to the changing needs of computer and related industry.

Department Mission Statements

The mission of the Department of Computer Science and Engineering is:

- i. To provide broad based quality education with knowledge and attitude to succeed in Computer Science & Engineering careers.
- ii. To prepare students for emerging trends in computer and related industry.
- iii. To develop competence in students by providing them skills and aptitude to foster culture of continuous and lifelong learning.
- iv. To develop practicing engineers who investigate research, design, and find workable solutions to complex engineering problems with awareness & concern for society as well as environment.

Program Educational Objectives (PEOs)

- i. The graduates will be efficient leading professionals with knowledge of computer science & engineering discipline that enables them to pursue higher education and/or successful careers in various domains.
- ii. Graduates will possess capability of designing successful innovative solutions to real life problems that are technically sound, economically viable and socially acceptable.
- iii. Graduates will be competent team leaders, effective communicators and capable of working in multidisciplinary teams following ethical values.
- iv. The graduates will be capable of adapting to new technologies/tools and constantly upgrading their knowledge and skills with an attitude for lifelong learning

Department Program Outcomes (POs)

The students of Computer Science and Engineering Department will be able:

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, Computer Science & Engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and Computer Science & Engineering sciences.
- 3. Design/development of solutions:** Design solutions for complex Computer Science & Engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- 4. Investigation:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- 5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex Computer Science & Engineering activities with an understanding of the limitations.
- 6. The Engineering and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice in the field of Computer Science and Engineering.
- 7. Environment and sustainability:** Understand the impact of the professional Computer Science & Engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- 8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the Computer Science & Engineering practice.
- 9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- 10. Communication:** Communicate effectively on complex Computer Science & Engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make

effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the Computer Science & Engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Department Program Specific Outcomes (PSOs)

The students will be able to:

1. Use algorithms, data structures/management, software design, concepts of programming languages and computer organization and architecture.
2. Understand the processes that support the delivery and management of information systems within a specific application environment.

Course Outcomes:

On successful completion of this course:

S No	Course Outcome
CO1	Identify [L1: Remember] and finalize the problem statement by surveying a variety of domains.
CO2	Specify [L2: Understand] the design methodologies appropriate to solve the problem.
CO3	Apply [L3: Apply] appropriate tools and techniques, resources to implement design exhibiting integrity and ethical behaviour of engineering practices.
CO4	Test and defend [L4: Analyze] their work along with their team members through reports and presentations.

CO-PO/PSO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3						3	3	3		3	3	3	
CO2		3		2		3		3	3		3		3	3
CO3			3	2	3			3	3		3	3	3	3
CO4								3	3	3	3			
Avg	3	3	3	2	3	3	3	3	3	3	3	3	3	3

Bitsecure: Hybrid Detection Model For Bitcoin Fraud
A

Report submitted in partial fulfillment of the requirement for the

Degree of

B.Tech.

In

Computer Science & Engineering

Under the Supervision of

Dr. Rohit Saxena

Associate Professor

By

Divyansh Saxena (2201640100144)

Deepali Sachan (2201640100126)

Aseem Pradhan (2201640100091)

Aryan Katiyar (2201640100087)

Asmita Chaurasia (2201640100099)

DECLARATION

We hereby declare that the work presented in this report entitled "Bitsecure: Hybrid Detection Model For Bitcoin Fraud", was carried out by us. We have not submitted the matter embodied in this report for the award of any other degree or diploma of any other University or Institute.

We have given due credit to the original authors/sources for all the words, ideas, diagrams, graphics, computer programs, experiments, results, that are not my original contribution. We have used quotation marks to identify verbatim sentences and given credit to the original authors/sources.

We affirm that no portion of my work is plagiarized, and the experiments and results reported in the report are not manipulated. In the event of a complaint of plagiarism and the manipulation of the experiments and results, we shall be fully responsible and answerable.

Name : Name :

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Signature : Signature :

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Certificate

This is to certify that Project Report entitled “Bitsecure: Hybrid Detection Model For Bitcoin Fraud” which is submitted by **Divyansh Saxena (2201640100144)**, **Deepali Sachan (2201640100126)**, **Aseem Pradhan (2201640100091)**, **Aryan Katiyar (2201640100087)**, **Asmita Chaurasia (2201640100099)**, in partial fulfilment of the requirement for the award of degree B. Tech. in Computer Science and Engineering(Specialization, if any) of Pranveer Singh Institute of Technology, affiliated to Dr. A.P.J. Abdul Kalam Technical University, Lucknow is a record of the candidates own work carried out by them under my/our supervision. The project embodies result of original work and studies carried out by the students themselves and the contents of the project do not form the basis for the award of any other degree to the candidate or to anybody else.

Signature:

Signature:

Name of Supervisor

Dr.

Designation

Designation

Department

Department

PSIT, Kanpur

PSIT, Kanpur

Abstract

The increasing global adoption of Bitcoin and other cryptocurrencies has introduced new possibilities for decentralized financial transactions, but it has also led to a rapid rise in fraud, illegal transfers, ransomware payments, and money laundering activities. Due to the pseudonymous and decentralized nature of blockchain networks, identifying fraudulent Bitcoin transactions has become a pressing challenge. Traditional fraud detection systems, which rely on heuristic rules and signature-based approaches, fail to address the dynamic, complex, and evolving patterns of modern financial cybercrimes. This highlights the need for intelligent, data-driven, and adaptive fraud detection solutions that can operate at scale and respond to emerging threats.

BitSecure is a hybrid detection model designed to improve the accuracy, reliability, and robustness of Bitcoin fraud detection by combining supervised machine learning and unsupervised anomaly detection techniques. Unlike traditional single-model systems, BitSecure leverages a multi-layered analytical approach that integrates both labeled transaction behavior and hidden anomalies within blockchain data. The project utilizes blockchain-specific features including transactional metadata, temporal patterns, monetary flow behavior, and address connectivity structures to effectively differentiate between legitimate and fraudulent activity. Through advanced feature engineering and hybrid ensemble learning, BitSecure minimizes false positives while significantly improving detection performance.

The supervised component of the system employs algorithms such as Random Forest, XGBoost, and Logistic Regression to learn from labeled fraudulent and legitimate transactions. Simultaneously, the unsupervised component integrates Isolation Forest, Local Outlier Factor (LOF), and Autoencoders to uncover unknown or zero-day fraud patterns that are not present in historical data. By combining both components using a weighted ensemble strategy, the hybrid model delivers higher accuracy, adaptability, and resilience against evolving fraud techniques.

The system is further enhanced with an evaluation pipeline utilizing precision, recall, F1-score, and ROC-AUC metrics to ensure reliable performance. The final model is deployed as a REST API, enabling real-time transaction monitoring for cryptocurrency exchanges and financial institutions. This deployment capability ensures practical applicability in real-world scenarios, where rapid decision-making and automated fraud detection are essential.

BitSecure contributes to the field of blockchain security by presenting a scalable, efficient, and intelligent fraud detection framework capable of identifying both known and emerging threats. The hybrid design ensures better generalization, reduced false positives, and improved adaptability compared to conventional methods. This research project aims to enhance the safety of digital asset ecosystems, support regulatory compliance, and strengthen the trust of users and organizations operating within cryptocurrency networks.

FYP-Time Line

FYP SCHEDULE ODD SEM 2025-2026

ACTIVITY	DEADLINE	PERSON INCHARGE	DOCUMENT/FORM
Title/Group Formation/ Supervisor Allocation	Till 2 nd week of March-2025	Supervisor/Group leader	Project Proposal
Proposal Submission	1 st week of May- 2025	Supervisor/DPC	Project Proposal
Progress Evaluation 1	2 nd week of August- 2025	DPC/ Evaluators	Power Point Presentation/Synopsis
Weekly performance Monitoring	Throughout the semester	Supervisor	FYP Diary
Progress Evaluation 2	2 nd Week of October -2025	DPC/ Evaluators	Power Point Presentation
End Semester Report (FYP Submission)	4 th week of November-2024	Supervisor	FYP Diary
Progress Evaluation 3	2 nd week of December – 2025	DPC/Evaluators	Power Point Presentation

Scheme Semester-VII

Course code	Course Name	Teaching Scheme			Credit Assigned			
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	Total
BCS-753	Project	0	8	0	0	4	0	4

(To be filled by Students for every week to show the Weekly Progress of Project)

Subject Code: BCS 753

Group Id:

Meeting Date

Session 2025 – 2026 (Odd Semester)

S No	Roll Number	Student Name	Status on Meeting Date (Present /Absent)	Student Signature
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2				
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4				
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Project Title : _____

Name of Project Supervisor: _____

Work done in current Week:

Work to be done in next Week :

Supervisor Comments:

Supervisor Signature/Date.....

(To be filled by Students for every week to show the Weekly Progress of Project)

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Work to be done in next Week :

Supervisor Comments:

Supervisor Signature/Date.....

(To be filled by Project Supervisor)

Project Title: _____

Project Id.: _____

Roll No	Name of the student	Grade by Supervisor

Type of the project (Software/ Software and Hardware/ Simulation or Modelling):

Any other Remark:

Supervisor Name:

Signature:

Grading Scheme:

A+: Outstanding

A: Excellent

B+: Good

B: Average

C: Not Satisfactory