PRANVEER SINGH INSTITUTE OF TECHNOLOGY

Major Project Proposal

Note:
Research Paper writing / Patent filing is mandatory for each team. Students are advised to choose their major project topic wisely.

Team Id: 26_CS_4C_04

Team Details:

S No	Full Name	Roll No	Branch & Section	Mob No
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Project Title:

BitSecure: Hybrid Ensemble Model for Bitcoin Fraud Detection

Domain: (Select all relevant Options)

1. Software-Web Application	2. Software-Mobile Application
3. Artificial Intelligence/Machine Learning/Deep Learning	4. Computer Vision/Image Processing
5. Blockchain	6. Internet of Things
7. Natural Language Processing	8. Big Data / Cloud Computing
9. Others (Specify if any):	

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Problem Statement:

The surge in Bitcoin adoption has been accompanied by a rise in sophisticated fraudulent activities, including money laundering and ransomware attacks, posing significant challenges to traditional detection methods. Existing systems often lack the robustness to handle the complexity and evolving nature of these threats, struggling with accuracy and efficiency. This proposal addresses the urgent need for a more effective fraud and security threat detection model in cryptocurrency transactions. By leveraging machine learning techniques, we aim to overcome the limitations of heuristic and signature-based approaches, providing a scalable and accurate solution that adapts to new fraud patterns, thereby securing blockchain-based financial systems.

Proposed Solution:

BitSecure is a hybrid ensemble model designed to enhance Bitcoin fraud detection by combining multiple machine learning algorithms. Our approach integrates supervised learning models with unsupervised anomaly detection techniques, to identify fraudulent transactions more accurately.

To improve performance, BitSecure utilizes feature engineering to extract key transaction patterns and blockchain metadata. Additionally, real-time monitoring and an adaptive learning framework ensure the model evolves with new fraud patterns.

By leveraging ensemble techniques, our solution enhances precision, minimizes false positives, and provides a scalable, efficient fraud detection mechanism. This system can be deployed as an API for financial institutions and cryptocurrency exchanges, helping secure Bitcoin transactions and mitigate financial risks in the evolving digital economy.

Unique/Distinctive feature of the solution:

1. BitSecure stands out with its hybrid ensemble approach, combining supervised and unsupervised learning for enhanced fraud detection accuracy. Unlike traditional models, it integrates blockchain-specific features with machine learning, ensuring adaptability to evolving fraud patterns. The system leverages real-time monitoring, adaptive learning, and anomaly detection to minimize false positives. Additionally, BitSecure is scalable and can be deployed as an API for financial institutions and crypto exchanges, ensuring seamless integration. Its multi-layered security approach makes it more robust and efficient than conventional fraud detection systems.

2. BitSecure differentiates itself through its hybrid ensemble approach, combining supervised and unsupervised learning. This multi-layered strategy enhances fraud

detection accuracy compared to single-algorithm models. Its integration of blockchain-specific features, real-time monitoring, and adaptive learning enables it to evolve with emerging fraud patterns, unlike static, traditional systems. The scalable API deployment ensures seamless integration for financial institutions and crypto exchanges, a feature not always present in competitor solutions.

Tools/Technology Uses:

1) **Hardware Requirements:**
   a) **Processor:** Intel Core i3/i5 (or AMD Ryzen 3/5) or higher
   b) **RAM:** Minimum 4 GB (Recommended 8 GB for large datasets)
   c) **Storage:** Minimum 256GB SSD (Recommended: 512GB SSD for faster data processing)
   d) **Graphics Card:** Optional (GPU recommended for deep learning models
   e) **Others:** Stable internet connection for cloud-based training and API deployment

2) **Software Requirements:**
   a) **Operating System:** Windows 10/11, Ubuntu 20.04+, or macOS
   b) **Development Tools:** Python (Jupyter Notebook, VS Code, or PyCharm), Google Colab for cloud-based training
   c) **Database:** PostgreSQL / MySQL for structured data, MongoDB for NoSQL
   d) **Web Browser:** Google Chrome, Mozilla Firefox, or Microsoft Edge
   e) **Others:** Docker for deployment, Flask/FastAPI for API development, TensorFlow/PyTorch for deep learning

3) **Others (If any):** Cloud computing (Google Cloud, AWS, or Azure) for large-scale model training, Blockchain explorers (e.g., Blockchair, Etherscan) for data analysis.

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(Proposal Evaluation Sheet Should be printed on a Separate Page)

(To be Filled by Faculty/Evaluator)

Proposal Evaluation:

1. Right Identification of the Problem (Appropriate selection of the problem)?
   a) Excellent b) Good c) Needs Improvement d) Unacceptable

2. Relevance of the Solution (Adequately addressing the problem/need)?
   a) Excellent b) Good c) Needs Improvement d) Unacceptable

3. Innovativeness in the Solution (Distinctive innovative components/features of the solution)?
   a) Excellent b) Good c) Needs Improvement d) Unacceptable

4. Uniqueness of the Solution (Intellectual Property Component)?
   a) Excellent b) Good c) Needs Improvement d) Unacceptable

Improvements/ Suggestions by the Evaluator:

1.
2.
3.
4.

Name of Faculty:

Designation: **Head of Department**

Signature with Date: **Signature with Date:**

Guidelines:

- One Proposal (Max length: 4 pages) per team will be submitted by the team leader only.
- A Team can have maximum 5 Members.
- For Heading font Size=14, Content font size =12, single spacing,Times New Roman type only.

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