Team Name:**Ghost141**

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Anti-Piracy Challenge

Executive Summary

This solution combats piracy while ensuring data integrity and security for digital content, proving an effective mechanism to prevent unauthorized distribution and providing proof of ownership. It is designed for content creators, photographers, and digital media companies.

Watermarking

Robust digital watermarks are embedded in images to prevent unauthorized use and enable traceability of content.

Steganography

Secure messages are hidden through LSB steganography, encrypting sensitive data using AES encryption algorithms.

Blockchain

Authenticity is ensured through blockchain-based fingerprinting, providing proof of ownership for digital content.

Problem Statement

The Growing Problem of Digital Piracy

Revenue Loss

Digital content creators face significant revenue loss due to widespread unauthorized distribution of their work.

Lack of Traceability

Existing solutions often lack strong traceability mechanisms, making it difficult to track and prevent piracy effectively.

Piracy poses a significant threat to digital content creators, leading to revenue loss and unauthorized distribution. Existing solutions lack strong traceability, secure authentication, and tamper-proof verification mechanisms. Traditional watermarking techniques can be easily removed, and metadata-based tracking is unreliable.

Proposed Solution

A Multi-Layered Solution

1 Robust Watermarking

DCT-based watermarking embeds invisible, frequency-domain watermarks resistant to resizing, cropping, and compression.

2 Secure Steganography

LSB steganography with AES encryption hides encrypted messages within image pixels to store ownership information securely.

3 Blockchain Fingerprinting

Generates a perceptual hash of the image and stores it on the blockchain for verification, ensuring authenticity and integrity.

Our solution consists of four core components, providing dual-layer protection, AES-encrypted hidden messages, and a decentralized blockchain ledger. A Tkinter-based interface enables users to easily watermark, encode, decode, and verify content.

Implementation Plan

Technologies Used:

Python
Tkinter (GUI)
OpenCV
PIL
NumPy (Image Processing)
AES Encryption (Security)
Blockchain (SHA-256)
(Content Authentication)

1 Phase 1 (Weeks 1-3)

System Design & Algorithm Implementation. Design system architecture and implement core algorithms.

2 Phase 2 (Weeks 4-6)

GUI Development & Feature Integration. Develop user-friendly interface and integrate key functionalities.

3 Phase 3 (Weeks 7-8)

Security Testing & Optimization. Conduct rigorous security testing and optimize system performance.

4 Phase 4 (Weeks 9-10)

Deployment & Industry Testing. Deploy solution and test within relevant industries.

Impact Assessment

This solution offers scalability across various media types and finds applications in digital art, stock photography, and corporate documents. Expected outcomes include enhanced piracy prevention through multi-layered security, reliable content verification using blockchain proof-of-ownership, and improved trust and adoption in digital content industries.

1

Scalability

Adaptable to various media types including images, videos, and documents, ensuring wide applicability.

2

Industry Applications

Suitable for digital art, stock photography, corporate documents, and media streaming services.

3

Enhanced Prevention

Multi-layered security measures significantly enhance piracy prevention.

Team Profile

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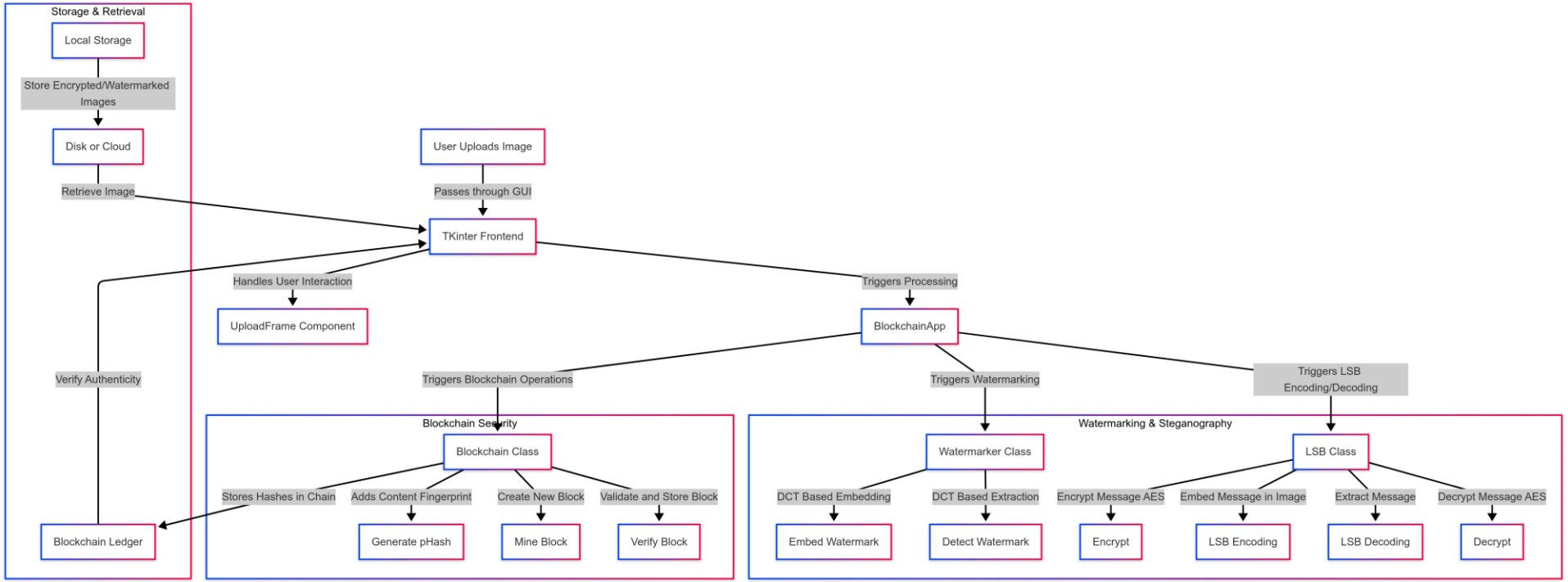
Supporting Materials (System Architecture Diagram**)**



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Anti-Piracy Challenge

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