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AI-Recognized Contribution Beyond Credentials

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Abstract: *Volunteer organizations and Non-Governmental Organizations (NGOs) play a crucial role in promoting social welfare activities such as environmental protection, disaster relief, community service, and education. However, verifying the authenticity of volunteer-reported activities remains a significant challenge. In many existing systems, volunteers upload images as proof of task completion, but there is no reliable mechanism to determine whether these images are genuine, duplicated, sourced from the internet, or generated using artificial intelligence tools. This lack of verification reduces transparency and trust in volunteer management systems. This research proposes an AI-Based Volunteer Work Verification and Reward Management System that automatically verifies images submitted by volunteers. The system integrates multiple techniques including Convolutional Neural Networks (CNN) for AI-generated image detection, Perceptual Hashing for duplicate image detection, Structural Similarity Index (SSIM) for image comparison, Time Series Analysis for monitoring volunteer activity patterns, a ranking algorithm for generating volunteer leaderboards, and a rule-based system for reward classification. The proposed system evaluates uploaded images through multiple verification stages before assigning points to volunteers. Based on accumulated points, volunteers are awarded achievement badges such as Bronze, Silver, and Gold, along with reward incentives. By ensuring authenticity and transparency in volunteer activity reporting, the system encourages genuine participation and enhances accountability within NGO-based volunteer management platforms.*

Key word *Artificial Intelligence, Image Hashing, Duplicate Detection, Deep Learning, Volunteer Verification, NGO Transparency, CNN, Metadata Analysis, Reward System.*

I. INTRODUCTION

Volunteer activities play a vital role in addressing social, environmental, and humanitarian challenges. Many Non-Governmental Organizations (NGOs) and community groups rely on volunteers to perform activities such as environmental protection, disaster relief, and community service. In most volunteer management systems, volunteers submit images as proof of completed tasks.

However, the verification of these images is often performed manually and lacks reliable mechanisms to ensure authenticity. Volunteers may upload duplicate images, reuse previously submitted images, download images from the internet, or submit AI-generated images to falsely claim credit. With the advancement of artificial intelligence and image editing technologies, detecting manipulated or generated images has become increasingly difficult.

To address this problem, this project proposes an AI-Based Volunteer Work Verification and Reward Management System that automatically verifies images uploaded by volunteers. The system integrates techniques such as Perceptual Hashing for duplicate image detection, Structural Similarity Index (SSIM) for image comparison, Convolutional Neural Networks (CNN) for AI-generated image detection, and Time Series Analysis to monitor volunteer activity patterns.

Additionally, the system includes a ranking algorithm to generate a volunteer leaderboard and a rule-based reward system that assigns badges such as Bronze, Silver, and Gold based on accumulated contribution points. The proposed system enhances transparency, improves trust in volunteer management systems, and encourages genuine participation in social service activities.

II. LITERATURE SURVEY

The verification of digital images has become an important research area due to the growth of digital platforms and artificial intelligence technologies. Various techniques have been developed to detect duplicate, manipulated, or AI-generated images and ensure the authenticity of digital content.

One common technique is Perceptual Hashing, which generates hash values based on the visual content of an image. This method can detect visually similar images even if they are slightly modified, resized, or compressed.

Another method used for image comparison is the Structural Similarity Index (SSIM). SSIM measures similarity between images based on luminance, contrast, and structural information, providing more accurate results than simple pixel comparison. With the advancement of deep learning, Convolutional Neural Networks (CNNs) have become effective for image classification and detection tasks. CNN models can identify complex visual patterns and are widely used for detecting manipulated or AI-generated images.

In addition to image verification, Time Series Analysis can be used to monitor user activity patterns and detect unusual behavior. Many systems also use Ranking Algorithms to generate leaderboards and encourage participation, while Rule-Based Systems classify users into reward categories based on predefined rules.

Although these techniques have been widely studied, most volunteer management systems still rely on manual verification. The proposed system integrates these methods to provide an automated and reliable solution for verifying volunteer activities and improving transparency.

III. METHODOLOGY

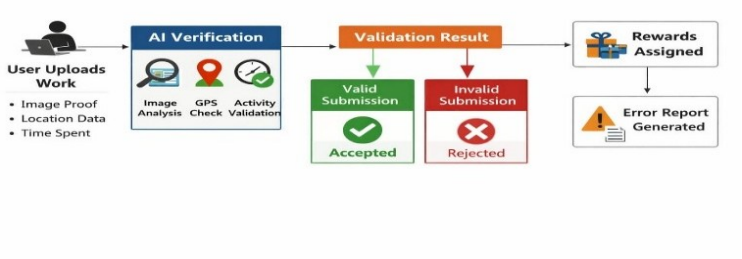
The proposed AI-Based Volunteer Work Verification and Reward Management System verifies the authenticity of volunteer activities using image processing and artificial intelligence techniques. The system follows a structured workflow including image upload, verification, activity analysis, ranking generation, and reward allocation.

A. User Registration and Authentication

Volunteers first register in the system by providing basic information such as name, email, and password. After registration, users can log in and access the platform. Authentication ensures that only registered users can submit volunteer activities.

B. Image Upload and Preprocessing

Volunteers upload images as proof of completed work. The images are preprocessed by resizing and normalizing them to ensure consistency for further analysis.



C. Duplicate Image Detection using Perceptual Hashing

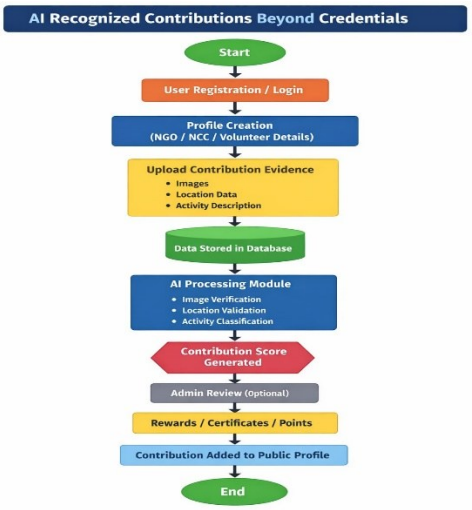
The system uses Perceptual Hashing to detect duplicate images. A hash value is generated based on the visual content of the image and compared with stored hash values in the database. If the similarity exceeds a predefined threshold, the image is identified as a duplicate.

D. Image Similarity Detection using SSIM

The Structural Similarity Index (SSIM) is used to compare the uploaded image with existing images. SSIM measures similarity based on luminance, contrast, and structural information. If the similarity score is high, the image may be flagged for further verification.

E. AI-Generated Image Detection using CNN

A Convolutional Neural Network (CNN) model is used to determine whether the image is real or AI-generated. The model analyses visual features such as textures, patterns, and edges to classify the image.



F. User Activity Monitoring

Time Series Analysis is used to monitor user activity patterns. If unusual behaviour such as frequent image uploads within a short time is detected, the system flags the activity as suspicious.

G. Ranking and Reward System

Once an image passes verification, the volunteer receives points. A Ranking Algorithm updates the leaderboard based on total points. A Rule-Based System then assigns reward badges such as Bronze, Silver, and Gold based on accumulated points.

H. System Workflow

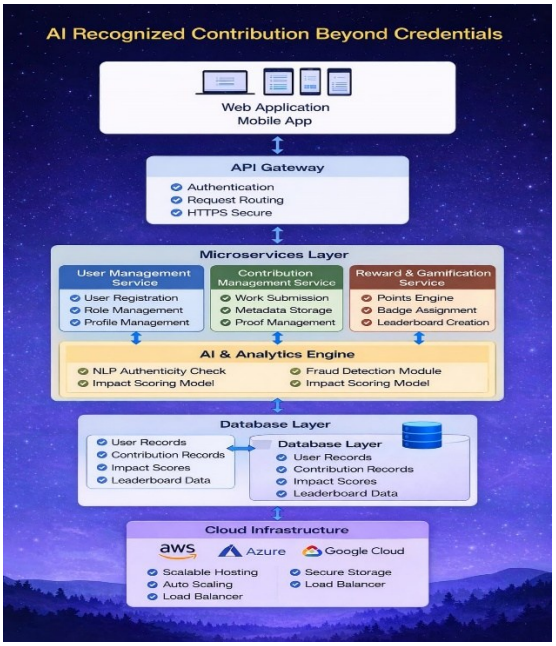
The system workflow includes: user registration, image upload, preprocessing, duplicate detection, similarity analysis, AI-image detection, activity monitoring, point allocation, for leaderboard update, and reward assignment.

This methodology ensures that only genuine volunteer activities are verified and rewarded, improving transparency and trust in the system.

IV. PROPOSED SYSTEM

The proposed system introduces an AI-Based Volunteer Work Verification and Reward Management System designed to improve transparency and reliability in volunteer activity reporting. The system verifies whether the images uploaded by volunteers as proof of work are authentic and not duplicated, manipulated, or AI-generated. By integrating multiple verification techniques, the platform provides an automated method for validating volunteer contributions.

The system is implemented as a web-based application where volunteers can register, log in, and upload images representing their completed activities. These images are analyzed through several verification stages before points and rewards are assigned.



A. User Module

The user module manages registration and authentication. Volunteers create accounts using basic details such as name, email, and password. After logging in, users can upload images, view their activity history, check accumulated points, and track their badge status.

B. Image Verification Module

This module verifies the authenticity of uploaded images. Perceptual Hashing is used to detect duplicate images, while Structural Similarity Index (SSIM) compares the uploaded image with existing images to identify visually similar or reused images.

C. AI Image Detection Module

To detect artificially generated images, the system uses a Convolutional Neural Network (CNN) model. The CNN analyses visual features of the image and determines whether it is a real photograph or AI-generated.

D. Reward System

The proposed system includes a points-based reward mechanism to encourage genuine social contributions. Each verified task is assigned a fixed number of points based on the work performed. Rewards are granted only after successful validation using image analysis, activity tracking, and location verification. This ensures authenticity while motivating users to actively participate in socially beneficial activities.

E. Admin Panel

The system includes an Admin Panel that allows administrators to monitor all volunteer activities. The panel displays user details such as email, work description, upload time, and location. Administrators can verify submitted works. This feature enhances transparency, ensures proper validation, and helps in detecting fraudulent activities.

V. TABLE OF ANALYSIS

The following table compares the limitations of existing volunteer management systems with the improvements provided by the proposed AI-based verification system.

Parameters	Existing System	Proposed System
Image Verification	Manual verification by administrators	Automated verification using AI algorithms
Duplicate Image Detection	Not available	Perceptual Hashing detects duplicate images
Image Similarity Detection	Not implemented	Structural Similarity Index(SSIM)compares images
AI-Generated Image Detection	Cannot Detect AI-generated images	CNN model detects synthetic images
User Activity Monitoring	No monitoring of user behaviour	Time Series Analysis tracks activity patterns
Fraud Prevention	Limited fraud detection	Multi-layer verification reduces fraud
Volunteer Ranking	Limited or unavailable	Ranking algorithm generates leaderboard
Reward Distribution	Basic or manual reward system	Rule-based system assigns badges
Transparency	Moderate transparency	Improved transparency and accountability
User Engagement	Low volunteer motivation	Reward system encourages participation

VI. RESULTS AND DISCUSSION

The proposed AI-Based Volunteer Work Verification and Reward Management System was implemented and tested to evaluate its effectiveness in verifying volunteer activity submissions. The system integrates multiple techniques including Perceptual Hashing, Structural Similarity Index (SSIM), Convolutional Neural Networks (CNN), Time Series Analysis, Ranking Algorithm, and a Rule-Based System.

During testing, different types of images such as genuine images, duplicate images, modified images, and AI-generated images were used. The Perceptual Hashing algorithm successfully detected duplicate images by comparing hash values with images stored in the database. The SSIM algorithm effectively identified visually similar images that had been slightly modified.

The CNN model demonstrated good performance in detecting AI-generated images by analyzing visual patterns and textures. Time Series Analysis monitored user upload patterns and helped detect unusual activity such as frequent submissions within a short time period.

The Ranking Algorithm generated a leaderboard based on volunteer points, encouraging participation and healthy competition. The Rule-Based System assigned reward badges such as Bronze, Silver, and Gold according to accumulated points. Overall, the results show that the proposed system improves the verification process, reduces fraudulent submissions, and increases transparency in volunteer activity management.

VII. SCOPE OF RESEARCH

The proposed AI-Based Volunteer Work Verification and Reward Management System provides an effective solution for verifying volunteer activities using artificial intelligence and image processing techniques. Although the system can detect duplicate images, identify AI-generated images, and manage volunteer rewards, there are several opportunities for future improvements. One possible enhancement is the integration of blockchain technology to store verification records securely. Blockchain can provide tamper-proof storage, ensuring that verified volunteer activities cannot be altered.

Another improvement is the use of GPS-based location verification, which can confirm whether the activity was performed at the correct location. This would add an additional layer of authenticity to the verification process.

Future research can also focus on improving AI-generated image detection by training more advanced deep learning models with larger datasets. In addition, developing a mobile application would allow volunteers to capture and upload images directly from their smartphones.

The system can also be enhanced through real-time image capture within the application to reduce fraudulent submissions and by deploying the platform on cloud infrastructure to support a larger number of users. Overall, the proposed system provides a foundation for further research in AI-based verification and transparent volunteer management systems.

VIII. CONCLUSION

The AI-Based Volunteer Work Verification and Reward Management System provides an effective solution for improving transparency and reliability in volunteer activity reporting. Traditional systems rely on manual verification, which can be time-consuming and prone to fraudulent submissions. The proposed system addresses these challenges by using artificial intelligence and image processing techniques to automatically verify uploaded images.

The system integrates multiple methods including Perceptual Hashing for duplicate detection, SSIM for image similarity comparison, CNN for AI-generated image detection, and Time Series Analysis for monitoring user activity. It also includes a ranking

algorithm to generate volunteer leaderboards and a rule-based reward system that assigns badges such as Bronze, Silver, and Gold based on accumulated points.

The results show that the system effectively detects duplicate and manipulated images while ensuring that only genuine volunteer contributions are rewarded. Overall, the proposed system improves transparency, accountability, and trust in volunteer management platforms and demonstrates the potential of AI in supporting social service initiatives.

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