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AI-Driven Medical Fundraising Verification System to Detect and Prevent Fraudulent Treatment Requests

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ABSTRACT

Medical fund fraud, where individuals fake treatment documents to solicit donations, is a growing concern in crowdfunding. Traditional verification methods are often manual, slow, and prone to error. This project introduces an AI-based system using YOLOv8 to detect text in medical bills and Paddle OCR to extract key information. Extracted data—like hospital names and treatment costs—is verified using fuzzy matching against a trusted hospital database. This automated approach enhances accuracy, blocks fraudulent requests, and helps restore donor trust.

Keywords: *Medical Fund, Medical Fund Fraud, AI-driven Approach, YOLOv8, Paddle OCR, Text Recognition, Fuzzy Matching Algorithm, Automated Verification*.

INTRODUCTION

Medical fundraising is the process of raising financial support for individuals who need funds for medical treatments, surgeries, or ongoing healthcare expenses. It is commonly done through crowdfunding platforms, charitable organizations, NGOs, and community-driven efforts. People create campaigns, share their medical conditions, and request donations from the public, friends, family, or corporate sponsors. With the rise of online fundraising platforms, individuals can share their medical fund requests through social media, websites, and donation portals. However, the lack of proper verification mechanisms has led to fraudulent activities where scammers create fake medical bills to exploit donors. Hence, advanced fraud detection systems using AI and pattern-matching algorithms are essential to ensure transparency and authenticity in medical fundraising.

PROPOSED SYSTEM

The proposed system aims to enhance the detection and prevention of fraudulent medical fund requests by integrating AI-driven technologies. It automates the verification process, ensuring accuracy and efficiency while minimizing human intervention.

AI-Based Fraud Detection

The system employs YOLOv8 for detecting text regions in medical bills and Paddle OCR for extracting textual information such as hospital names, patient details, and treatment costs. These extracted details are then analyzed to identify potential discrepancies.

Pattern Matching for Verification

To ensure authenticity, the system utilizes the Fuzzy Matching Algorithm, which compares extracted text with a trusted hospital dataset. This method effectively measures similarity and detects inconsistencies in treatment details, preventing fraudulent fund requests.

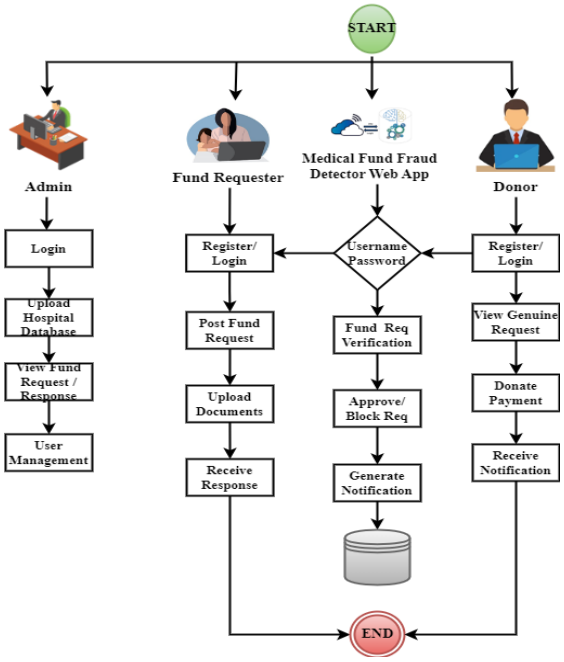
Automated Document Processing

Unlike traditional manual verification methods, the proposed system automates document processing, significantly reducing the time required for fraud detection. It eliminates human errors and ensures consistency in identifying fake medical fund requests.

Secure and Transparent Donation Process

The system enhances donor confidence by providing a transparent verification process. Only verified medical fund requests are displayed to potential donors, ensuring that contributions reach genuine beneficiaries.

SYSTEM ARCHITECTURE



Project Description (Short V

The Medical Fund Fraud Detection System uses AI to detect fake medical fund requests and ensure secure, transparent crowdfunding. It employs YOLOv8 for text detection and OCR to extract data from medical documents, which is then verified against a hospital database using fuzzy logic. Built with Python, Flask, MySQL, and OpenCV, the system classifies requests as valid, suspicious, or fraudulent. Key features include a secure payment gateway, real-time alerts, and admin review, helping protect donors and support genuine patients efficiently.

TEST CASES

1. Test Case ID: TC001
- **Input:** User enters valid registration details (username, email, password).
- **Expected Result:** System registers the user successfully.
- **Actual Result:** User registration successful.
- **Status:** Pass

2. Test Case ID: TC002
- **Input:** User logs in with correct credentials.
- **Expected Result:** System grants access to the user dashboard.
- **Actual Result:** User successfully logged in; dashboard accessible.
- **Status:** Pass

3. Test Case ID: TC003
- **Input:** Admin logs in with correct credentials.
- **Expected Result:** System allows access to the admin interface.
- **Actual Result:** Admin successfully logged in; admin dashboard accessible.
- **Status:** Pass

4. Test Case ID: TC004

Input: User uploads a valid medical bill image.
- **Expected Result:** System accepts the file and stores it for processing.
- **Actual Result:** File uploaded and stored successfully.
- **Status:** Pass

5. Test Case ID: TC005
- **Input:** User uploads an unsupported file format.
- **Expected Result:** System rejects the file and displays an error message.
- **Actual Result:** Error message displayed: "Invalid file format."
- **Status:** Pass

6. Test Case ID: TC006
- **Input:** User uploads a clear medical bill image.
- **Expected Result:** System extracts text successfully.
- **Actual Result:** Text extracted without errors.
- **Status:** Pass

TEST REPORT

Introduction

The project is designed to detect fraudulent medical fund requests by analyzing uploaded hospital bills using Optical Character Recognition (OCR) and pattern-matching techniques. The system automates fund request verification and ensures donors contribute only to genuine cases. This report provides an overview of the testing process, including test objectives, scope, environment, and conclusions.

Test Objective

The primary objective of testing is to validate the system's functionalities, ensuring accuracy, security, and reliability. The tests focus on:

- User authentication (Registration & Login)
- Medical bill upload and text extraction
- Fraud detection using pattern matching
- Fund request approval/rejection process
- Secure donor transactions
- Performance under high loads

Test Scope

The test covers all critical system functionalities, including:

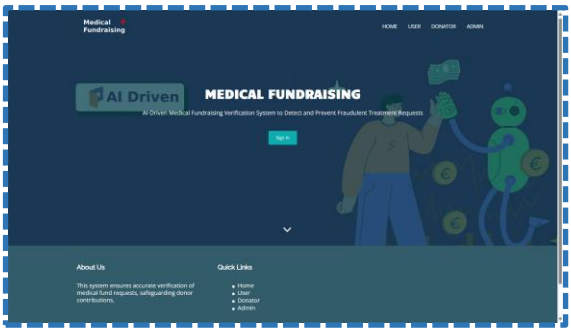
- **Functional Testing**: Validates core features such as user authentication, bill uploads, fraud detection, and donations.
- **Security Testing**: Ensures protection against cyber threats such as SQL injection and unauthorized access.
- **Performance Testing**: Tests system stability and response times under heavy loads.
- **Usability Testing**: Evaluates user experience and ease of navigation.

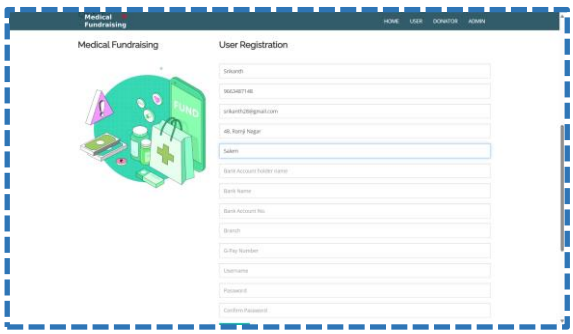
Test Environment

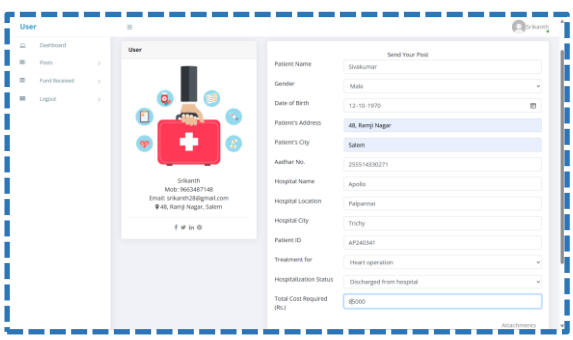
- **Operating System**: Windows 10/Linux
- **Backend**: Python (Flask), MySQL
- **Frontend**: HTML, CSS, JavaScript (Bootstrap)
- **Database**: MySQL 5.7
- **Testing Tools**: Selenium (for UI automation), JMeter (for load testing), Postman (for API testing)

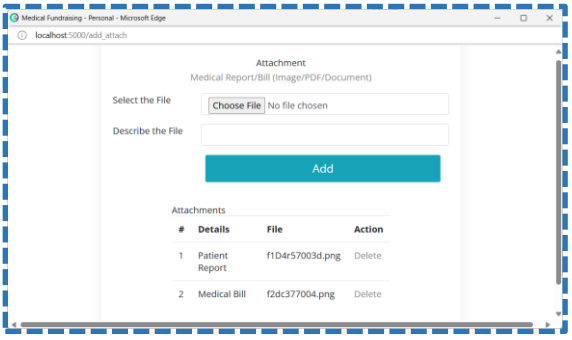
Test Conclusion

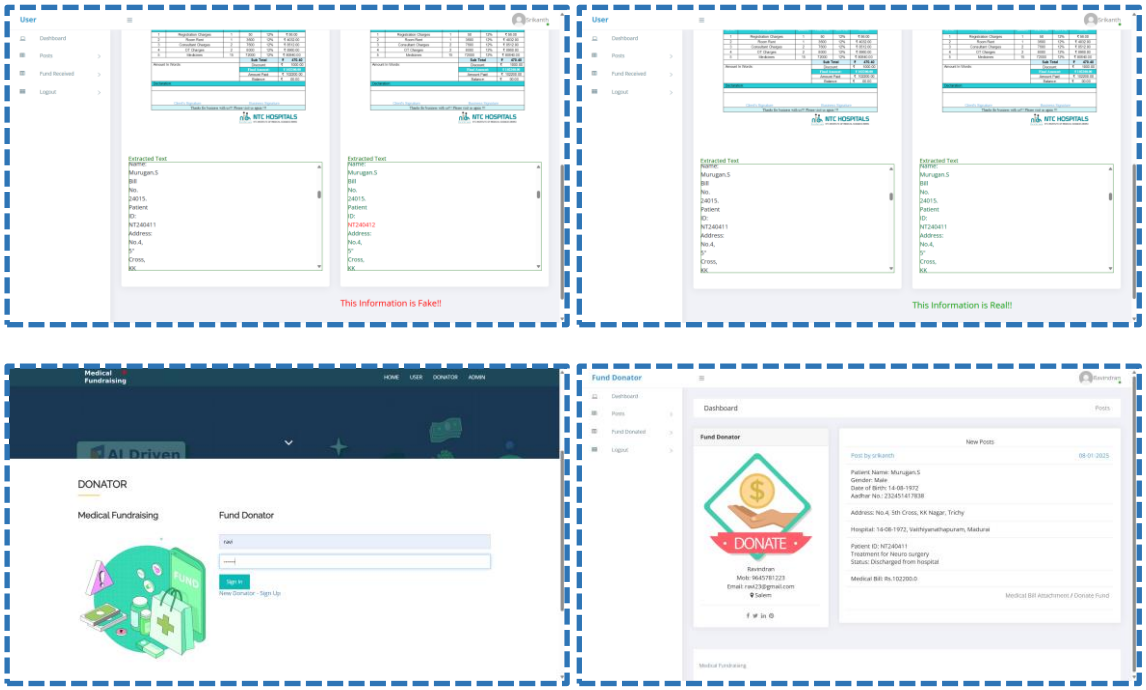
The testing phase successfully validated the system’s functionalities. All major test cases were executed, and the system met the expected outcomes. The fraud detection algorithm effectively identified fraudulent cases, ensuring accuracy in fund verification. The system performed well under various conditions without major slowdowns. Minor UI-related issues were identified and resolved











CONCLUSION

Smart Medical Fund Verification

Medical fund fraud is a growing problem, wasting resources and delaying aid for real patients. Our current, manual systems are slow, error-prone, and can't catch fakes.

We've developed an **intelligent, automated Medical Fund Verification System**. It uses advanced tech like **YOLOv8, OCR, and machine learning** to detect forged documents, manipulated bills, and fake hospital stamps. This ensures only genuine requests get funding.

Our system features **automated fraud detection, a trust score, real-time alerts, and secure payments**. It makes fund verification more accurate and efficient, cutting down on fraud and boosting transparency. By increasing donor confidence and streamlining aid, our system is a reliable way to fight medical fund fraud.

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