Software Engineering Project

CS1503

Project Title: Lost and Found Platform for College

Submitted By-

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Introduction:

In a college environment, students and staff frequently lose personal items such as phones, bags, wallets, or even smaller items like ID cards and keys. Locating these lost belongings becomes a challenge in a large campus with diverse activity zones. To address this common issue, we aim to develop a Lost and Found platform specifically designed for our college. This platform will streamline the process of reporting lost or found items, utilizing AI-based matching to identify and notify the rightful owner when their belongings are found.

Project Objectives:

The primary objective of this project is to create an easy-to-use digital platform where:

1. Users can report items they have found on campus by providing a description and uploading images.

2. Individuals who have lost items can submit requests by describing their lost belongings.

3. The backend system, using AI-based natural language processing (NLP), will match descriptions of lost and found items to inform the owner when a potential match is found.

4. A secure and user-friendly interface ensures a smooth and accessible experience for all users.

Platform Features:

1. Lost Item Reporting:

   Users who lose an item on campus can visit the platform and file a report. The system will prompt the user to describe the lost item, upload an optional image, and specify any unique details such as the item's location, time of loss, and identifying marks. This data will be stored in the database.

2. Found Item Posting:

   For individuals who find a misplaced item, they can register it on the platform by providing a description and uploading images of the object. This information will also be saved in the platform's database for potential matching.

3. AI Matching System:

   At the core of the platform is the AI-powered matching system. When a user posts either a lost or found report, the AI scans both the lost and found item descriptions stored in the database. Using algorithms for text similarity and feature extraction, the AI identifies possible matches between lost and found items. When a match is detected, the platform alerts both parties, informing the person who lost the item that their belongings have potentially been found.

4. User Authentication and Privacy:

   Users will be required to sign in using their college credentials to maintain security and privacy. This ensures that only authorized college members can access the platform. Additionally, the platform will protect the personal details of both the item finder and the owner, limiting information sharing to only what is necessary for item recovery.

Technical Overview:

1. Frontend:

   The user interface will be designed to ensure ease of use. It will include intuitive forms for reporting lost and found items, image uploads. Frontend development tools such as React.js or Angular will be employed to create a seamless user experience.

2. Backend:

   The backend of the platform will be built using Node.js and Express, allowing for efficient handling of requests, image uploads, and data storage. MongoDB or PostgreSQL will serve as the database for storing user reports, images, and matching data.

3. AI-Based Matching:

   The heart of the system is the AI engine that uses natural language processing (NLP) for description matching. Pretrained NLP models such as BERT or Open Ai's GPT-3 can be utilized to compare the descriptions of lost and found items. By calculating the semantic similarity between reports, the AI identifies items with high matching scores.

AI Matching Process:

The description matching involves extracting key features such as object type, color, size, and any unique characteristics. The AI model processes the description provided by the finder and the one submitted by the person reporting the loss, looking for common patterns and matching keywords. A similarity score is calculated based on how closely the descriptions align. If the score exceeds a predefined threshold, the system flags the match and notifies the user.

Future Scope and Expansion:

Once the platform is functional, additional features could be implemented, such as:

- Geolocation Services: Allow users to specify the location where the item was found or lost on a campus map.

- Mobile App Development: A mobile app version can be introduced for easier access and real-time notifications.

Conclusion:

Our Lost and Found platform will provide an organized and efficient solution to address the frequent issue of misplaced items on campus. With an intuitive user interface, AI-driven description matching, and an automated notification system, the platform aims to make the process of recovering lost items as smooth and transparent as possible. By implementing this project, we aim to create a supportive and helpful environment for students and staff alike.