

A Unified Object Recovery For Campus Communities

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Abstract- This paper presents a Unified Object Recovery System for Campus Communities designed to simplify the management of lost and found items within educational institutions. Traditional methods such as notice boards and verbal communication are inefficient and unorganized. The proposed system provides a centralized web-based platform where users can report lost or found items with details such as description, location, date, and images. The system supports searching, matching, and notification features to improve item recovery efficiency. It reduces manual effort, enhances transparency, and ensures secure access through user authentication

Keywords: Lost and Found System, Campus Recovery, JavaFX, MySQL, Web Application, Object Tracking

I. INTRODUCTION

1.1 Background

Managing lost and found items in educational institutions is often difficult due to the absence of a centralized system. Traditional methods rely on notice boards, security offices, or verbal communication, which are time-consuming and unreliable. This leads to poor tracking and lower recovery rates of lost belongings.

1.2 Need for Smart Waste Management

Students and staff frequently lose personal belongings such as ID cards, wallets, books, and electronic devices. Without proper management, these items may never be recovered. A digital system can improve communication, automate item tracking, and provide real-time updates to users.

1.3 Scope of the System

The proposed system can be implemented in colleges, universities, and campus communities. It provides an easy-to-use platform for reporting, searching, and matching lost and found items while ensuring security and transparency.

II. PROBLEM STATEMENT

In many colleges and educational institutions, lost and found items are managed using traditional methods such as notice boards, verbal communication, or social media groups. These methods are unorganized, time-consuming, and inefficient, making it difficult for students and staff to report or recover lost belongings. Due to the lack of a centralized system, information about lost or found items is often scattered, leading to confusion, delays, and low recovery rates. Valuable items such as ID cards, wallets may remain unclaimed because users are unable to access accurate and updated information.

Additionally, manual handling of lost and found records increases the possibility of errors, duplicate reports, and false claims. There is no proper mechanism to track item status, verify users, or provide real-time updates regarding possible matches.

III. OBJECTIVES

3.1 Main Objective

The main objective of this project is to develop a Unified Object Recovery System for Campus Communities that manages lost and found items efficiently through a centralized digital platform.

3.2 Specific Objectives

The system aims to provide a centralized and user-friendly platform for managing lost and found items within campus communities. It focuses on simplifying the process of reporting lost or found items by allowing users to upload important details such as item description, location, date, and images. The system also aims to improve transparency and communication among students and staff by maintaining organized digital records and providing easy access to item information.

IV. LITERATURE SURVEY

Several studies have focused on smart lost-and-found systems using modern technologies. Web-based and cloud-

based systems provide centralized storage and real-time accessibility for item management. IoT-enabled solutions use RFID and Bluetooth technologies for object tracking. Research also highlights the importance of search algorithms, notification systems, and secure authentication in improving recovery rates and user experience.

V. PROPOSED SYSTEM

5.1 Overview

The proposed system is a web-based application developed using Java and JavaFX with MySQL database support. It allows users to report lost or found items, search records, and receive notifications about possible matches.

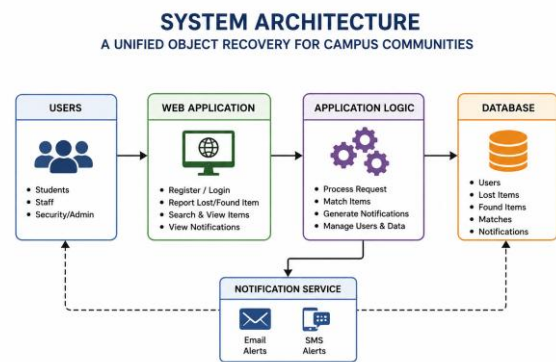
5.2 Working Principle

The Unified Object Recovery System works as a centralized platform for managing lost and found items within the campus. Users can register, log in, and report lost or found items by entering details such as item name, description, location, date, and images. All information is stored securely in a centralized database for easy access and tracking. The system also provides search options to help users quickly find relevant items.

The system uses keyword-based matching algorithms to compare lost and found item records and identify possible matches. When a match is detected, notifications are sent to the respective users to improve the recovery process. Real-time updates and automated record management reduce manual effort and improve transparency. Overall, the system provides a secure, efficient, and user-friendly solution for campus object recovery management.

VI. SYSTEM ARCHITECTURE

The system architecture consists of five main components: Users, Web Application, Application Logic, Database, and Notification Service. Students, staff, and administrators interact with the system through the web application to register, report lost or found items, search records, and view notifications. The application logic processes requests, matches items, and manages system operations. All information is stored securely in the MySQL database, while the notification service sends real-time alerts to users through email or SMS.

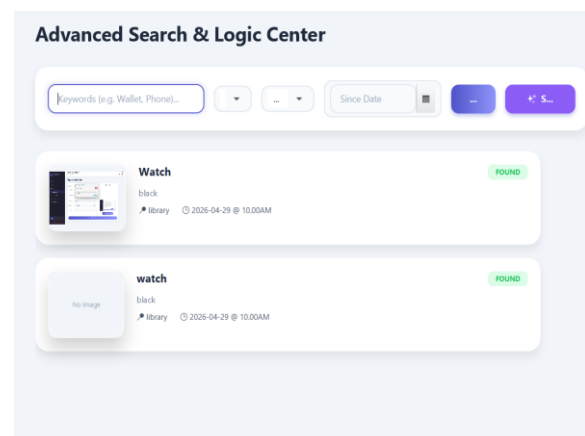


VII. METHODOLOGY

The project follows an iterative development methodology. Initially, system requirements are analyzed and modules are designed separately. Modules such as authentication, reporting, searching, and notifications are implemented and tested individually before integration. The system undergoes functionality, performance, and usability testing to ensure reliability.

VIII. SOFTWARE IMPLEMENTATION

The system is developed using Java programming language with JavaFX framework for the graphical user interface. MySQL is used for database management. The application includes modules for registration, login, item reporting, searching, matching, and notifications.



X. RESULTS AND DISCUSSION

The system was tested under different scenarios to evaluate performance and usability. Users were able to report and search items successfully. The keyword-based matching feature improved the chances of item recovery. Notifications provided real-time updates, and the user interface was simple and easy to navigate. Overall, the system reduced manual

effort and improved efficiency in managing lost and found items.

XI. ADVANTAGES

The proposed system offers several advantages such as centralized item management, reduced manual effort, faster recovery process, secure user authentication, and real-time notifications. It is scalable, user-friendly, and suitable for campus environments.

XII. APPLICATIONS

The Unified Object Recovery System can be used in colleges and universities to manage lost and found items efficiently. It helps students, staff, and security authorities track and recover misplaced belongings quickly. The system can also be implemented in libraries, hostels, railway stations, and public institutions where item management is required. It reduces manual work and improves communication between users and authorities. The application provides a secure, organized, and user-friendly solution for managing lost and found records.

XIII. FUTURE ENHANCEMENTS

The system can be further enhanced by integrating image recognition technology for automatic item matching based on uploaded images. A mobile application can also be developed to provide easier access and instant notifications for users. GPS-based location tracking can be added to identify the exact place where items were lost or found. Artificial Intelligence techniques may be implemented to improve search accuracy and recommendation features. Additionally, cloud storage and advanced security mechanisms can be integrated to improve scalability, data protection, and overall system performance.

XIV. CONCLUSION

The Unified Object Recovery System for Campus Communities provides an efficient and reliable solution for managing lost and found items. By integrating modern web technologies, centralized storage, and automated matching features, the system improves transparency, reduces manual work, and increases the chances of successful item recovery. It serves as a scalable solution for modern campus environments.

REFERENCES

- [1] K.-H. Lee and J.-N. Hwang, "On-road pedestrian tracking across multiple driving recorders," *IEEE Transactions on Multimedia*, vol. 17, no. 9, pp. 1429–1438, Sep. 2015.
- [2] S. Tang, M. Andriluka, B. Andres, and B. Schiele, "Multiple people tracking by lifted multicut and person re-identification," in *Proc. IEEE Conf. Computer Vision and Pattern Recognition (CVPR)*, Jul. 2017, pp. 3539–3548.
- [3] R. Singer, "Estimating optimal tracking filter performance for manned maneuvering targets," *IEEE Transactions on Aerospace and Electronic Systems*, vol. AES-6, no. 4, pp. 473–483, Jul. 1970.
- [4] M. Isard and A. Blake, "Condensation—conditional density propagation for visual tracking," *International Journal of Computer Vision*, vol. 29, no. 1, pp. 5–28, 1998.
- [5] Y. Cheng, "Mean shift, mode seeking, and clustering," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 17, no. 8, pp. 790–799, 1995.
- [6] J. F. Henriques, R. Caseiro, P. Martins, and J. Batista, "High-speed tracking with kernelized correlation filters," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 37, no. 3, pp. 583–596, Mar. 2015.
- [7] P. Li, D. Wang, L. Wang, and H. Lu, "Deep visual tracking: Review and experimental comparison," *Pattern Recognition*, vol. 76, pp. 323–338, Apr. 2018.