



Streamlining Attendance Management in Education: A Web-Based System Combining Facial Recognition and QR Code Technology

Emily Sing Kiang Siew^{1,*}, Zhi Yan Chong¹, Sah Nah Sze², Richki Hardi³

¹ Faculty of Computing and Software Engineering, i-CATS University College, Jalan Stampin Timur, 93350 Kuching, Sarawak, Malaysia

² Faculty of Computer Science & Information Technology, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia

³ Department of Informatics, Universitas Mulia, Balikpapan, Indonesia

ARTICLE INFO

Article history:

Received 26 August 2023

Received in revised form 5 October 2023

Accepted 16 October 2023

Available online 2 November 2023

Keywords:

Attendance System; Web-Based; QR Code; Haar Cascade; LBPH

ABSTRACT

Attendance tracking has long posed challenges in educational institutions due to the inefficiency and error-prone nature of traditional paper-based methods. In response, many institutions have embraced web technologies and automated attendance systems, incorporating biometrics, QR codes, barcodes, and RFID-based technologies. However, the applicability of these systems may vary across different educational settings. This paper introduces a web-based student attendance management system that combines facial recognition technology and QR codes to address the challenges associated with manual attendance tracking in a university college. The system leverages a centralized database for streamlined monitoring and auditing of attendance records, offering the flexibility to choose between face recognition and QR code attendance marking options. User acceptance tests were conducted to evaluate the system's effectiveness, and the results indicate that the proposed system greatly improves attendance tracking transparency and demonstrates high usability based on positive user ratings. Additionally, the preference for face recognition over QR code scanning was evident. Incorporating these technologies into the automated attendance system represents a substantial advancement in educational technology, offering an accurate and efficient way of recording attendance.

1. Introduction

1.1 Background

In the current academic system, regular attendance by students in classes plays a pivotal role in assessing students' performance and measuring their participation in a course [1,2]. Moreover, in certain institutions, attendance in a course is mandatory as a prerequisite for taking the exam. The conventional manual student attendance system has been widely used in educational institutions for many years. However, manually marking attendance using paper-based sheets and calling out names can be a laborious and tedious task, especially in classrooms with a high teacher-to-student ratio. To overcome challenges like impersonation, tampering with records, or signing in for absent friends, an

* Corresponding author.

E-mail address: emily@icats.edu.my

<https://doi.org/10.37934/araset.33.2.198208>