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## SwiftVerify: A Multi-Modal Smart Attendance System

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**Abstract** - In response to the growing demand for enhanced attendance systems in educational institutions, this paper proposes a ground breaking Multi-Factor Attendance System. Vulnerabilities in traditional approaches include inaccuracies in human data entry and vulnerability to unauthorised access. Our technology offers a multi-layered authentication procedure by combining voice matching, facial recognition, and barcode scanning technologies to overcome these issues. By doing this, security is improved and human data entry errors are reduced. In addition, our system's centralised database allows for real-time attendance updates, providing relevant information on attendance trends and patterns. We hope to enhance attendance management and make a major technological contribution to the development of educational institutions with this creative approach.

**Keywords** - Multi-Factor Attendance System, Educational Institutions, Vulnerabilities, Security, Real-time Attendance Updates, Centralized Database, Attendance Trends, Attendance Management

### I. INTRODUCTION

Traditionally, maintaining student involvement and operational efficiency in the context of educational institutions has depended heavily on the regulation of attendance. Historically, manual techniques like paper-based registers or crude electronic systems have been used for attendance tracking. These methods, however, are time-consuming, prone to error, and devoid of the strong security features required to protect confidential attendance information. The demand for more advanced attendance systems has arisen due to the rapid growth of technology. These systems must be able to reliably record attendance, ensure strict authentication, and provide meaningful data for decision-making processes.

To overcome these issues, this study presents a ground breaking Multi-Factor Attendance System. Our solution combines voice matching, facial recognition, and barcode scanning technologies, drawing on the development of attendance management systems and biometric technology improvements. Our system's cornerstone, multi-factor authentication, requires numerous kinds of authentication to ensure thorough user verification. This strategy reduces the drawbacks connected to single-factor authentication techniques while also improving security. By using a range of biometric modalities, our system provides a strong and dependable authentication method, reducing the possibility of identity theft and unwanted access.

By offering a complete and safe solution that expedites procedures and improves data accuracy, our research aims to completely transform attendance management in educational institutions. In addition to providing increased security, our system makes use of cutting-edge technology like voice-recognition and facial identification to deliver insightful data about attendance patterns and trends. With the ability to make decisions and allocate resources more efficiently based on real-time attendance data, educational institutions will be better equipped as a result. Ultimately, our Multi-Factor Attendance System contributes to increased effectiveness, security, and transparency in learning environments by marking a substantial technological development in attendance management systems.

### II. RELATED WORK

[1] Despite technological developments, the outdated practice of human attendance logging has continued, leading to errors and inefficiencies. Using speech recognition technology presents a viable way to solve this problem and provide accurate, automatic attendance tracking. Utilising Google's speech recognition module is proposed system, which is incorporated into an easy-to-use Kivy application that runs in a Python environment. This technology guarantees precision and dependability in attendance recording while also doing away with the need for personal intervention. Furthermore, stakeholders in corporate offices and educational institutions can easily access thorough attendance status thanks to the integration of a sophisticated user interface.

Through the implementation of this novel strategy, this successfully address the persistent issue of imprecise attendance recording, opening the door to more efficient and streamlined operations. Approach, which is based on speech-recognition technology, reduces errors and improves accessibility for both staff members and students. Moreover, the accuracy rate of 95% indicated in "Mary Meeker's annual Internet Trends Report highlights" how well answer meets the exacting requirements of attendance tracking.

[2] The manual method of keeping track of student attendance in classes is prone to manipulation and is therefore often unsuccessful. In an attempt to automate the process of tracking attendance, the Automated Attendance System (AIDACE) was created in response to this problem. AIDACE uses face recognition technology to identify pupils in the classroom automatically and in real time. The technology precisely tracks attendance by taking pictures in real time and comparing them to reference faces stored in the dataset.