

A Review on Student Tracking System in School Bus using Face Recognition and IOT

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Abstract: School buses are the main way kids get to school every day. The Student Tracking System in School Bus Using Face Recognition and IoT is a smart idea to make school transportation safer and better. This system uses fancy technology to watch over students while they're on the bus. It uses facial recognition to figure out who's getting on and off the bus. Each student's face is put into the system, and it checks if they're the right person in real-time. The bus also has special devices connected to the internet (IoT) to track where it is in real-time using GPS. This helps parents, school people, and transportation folks see where the bus is and where it's going. The Student Tracking System in School Bus Using Face Recognition and IoT is a super modern solution to make school transportation safer and more efficient.

Keywords: Face Recognition, GPS and IoT.

I. INTRODUCTION

In recent years, ensuring the safety and security of students during their daily commute to and from school has become a paramount concern for parents, schools, and transportation authorities. The traditional methods of monitoring school buses and tracking student attendance have proven to be inadequate and often fall short of providing real-time information and comprehensive security measures. To address these challenges, the integration of cutting-edge technologies such as Facial Recognition and the Internet of Things (IoT) has emerged as a promising solution. The Student Tracking System in School Bus Using Face Recognition and IoT represents a groundbreaking innovation that aims to revolutionize the way student transportation is managed and safeguarded. In the modern worlds, ensuring the safety and well-being of students during their daily commute to school has become a top priority for parents, educational institutions, and transportation authorities. Traditional methods of managing school bus transportation, which often rely on manual processes and paper-based attendance tracking, are no longer sufficient to address the evolving challenges of student safety and operational efficiency. In response to these critical concerns, emerging technologies have paved the way for groundbreaking innovations in the form of the student Tracking System in School Bus Face Recognition and IoT .

II. LITERATURE REVIEW

Anu Nandhini J2 [1] To maintain students' safety while travelling, the proposed system will use face recognition model to identify students and track various parameters such as the number of passengers, adherence to the route and schedule, location, and other data required by the school and parents. This system will then send the relevant information via SMS to the parents.

Raj, J. T., Sankar, J. [2] The proposed system provides real time information about various parameters of the vehicle like the location, the route, the speed, the list of passengers, the adherence of drivers to schedule and much more and allows the parents to be notified when their ward alights or boards the bus. It is important for every school to have a trustworthy and secure transportation service to ensure the safety of the students. It helps the school administration to effectively manage their bus fleet and potentially reduce mishaps

Kamisan, M.T., Aziz,[3] bus tracking and monitoring system for the school bus, provide the safety for the students that enable the parents and school authorities to track the location of the bus as well as the authorities can be able to monitor the speed of the bus to assure that the driver is not in danger driving. Due to the dearth of research in tracking and monitoring systems .This paper developed a real time public transport tracking and monitoring system using GPS module

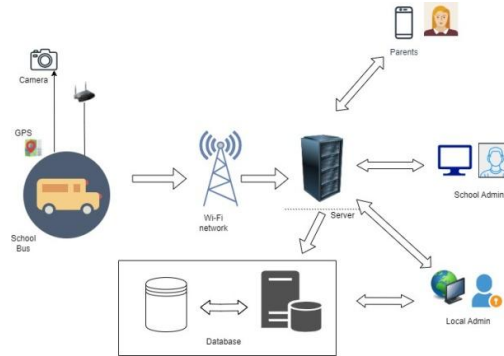


Fig. 1. Architecture of proposed system

III. SYSTEM ARCHITECTURE

The School bus plays a responsible role in transporting students from their home to school on a daily basis. Many Safety concerns may arise while transporting children to and from school This System proposes the necessary safety precautions for school-age children by focusing on the techniques of the bus tracking system and the security system installed in it, allowing the children commute in a safe and secure manner.

Figure 1. In the following diagram fig 1. used in various sensors like GPS, Camera and other sensors. First student enters the bus and the capture the face using camera then store the database is match and then send the data through the text message to parents and college admin.

IV. BACKGROUND

The background of student tracking systems in school buses can be traced back to the need for improved safety and efficiency in student transportation. Traditionally, schools relied on manual methods, such as paper-based attendance sheets or visual checks, to track students on buses. However, these methods were prone to errors, lacked real-time data, and did not provide a comprehensive solution for ensuring student safety. With advancements in technology, student tracking systems in school buses have emerged as a solution to address these challenges. These systems leverage technologies such as GPS, RFID (Radio Frequency Identification), and biometric identification (such as face recognition) to accurately track student attendance, monitor their whereabouts, and enhance communication with parents and school staff. The implementation of student tracking systems in school buses has gained traction due to several reasons.

- **Safety Concerns:** Ensuring the safety of students during transportation is a top priority for schools. By implementing a student tracking system, schools can monitor student boarding and exiting, detect unauthorized individuals on the bus, and provide real-time alerts in case of emergencies or deviations from the planned route.
- **Attendance Management:** Student tracking systems automate the process of taking attendance on the bus.
- **Communication with Parents:** Student tracking systems facilitate better communication with parents by providing real-time notifications about their child's boarding and exiting the bus.
- **Efficiency and Optimization:** By tracking student pick-up and drop-off locations, student tracking systems enable schools to optimize bus routes. Schools can also analyze data on bus utilization and performance to make informed decisions regarding their transportation fleet.
- **Compliance and Accountability:** Student tracking systems assist schools in maintaining compliance with transportation regulations and ensure accountability for student transportation.

V. APPLICATIONS

Various application including:

- **Face Detection and Recognition Algorithm:** For face recognition, you'll need a robust algorithm that can detect and recognize faces in real-time. OpenCV, Dlib, and deep learning-based approaches using Convolutional Neural Networks (CNNs) such as Open Face, Face Net, or the Face Recognition library are commonly used for this purpose.
- **Security and Privacy Measures:** Implement robust security measures to protect the data, especially when dealing with sensitive information like student identities. Encryption, access controls, and secure authentication mechanisms are essential.
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- **Real-time Alerts and Notifications:** Implement real-time alerting and notification systems to inform parents and school administrators about important events, such as the bus arriving at the school or any unexpected delays.
- **Integration with IoT:** This technology can be integrated into IoT-based student tracking systems using face recognition.
- **Route Optimization:** By tracking student pick-up and drop-off locations, the system can optimize bus routes, minimizing travel time and reducing fuel consumption
- **Parent Communication:** The system can send real-time notifications to parents, informing them when their child boards and exits the bus, providing peace of mind and improving communication between parents and the school.

VI. CONCLUSION

The school bus app helps users to easily track the bus, making sure it's safe and on schedule. Users can check the bus's location, speed, and any delays. They can also contact the driver or authorities when necessary. Administrators use the app to manage students, change bus schedules, and see who's on each bus. It's a useful way for schools to keep an eye on drivers and for parents to know where their children are during the bus ride. In summary, this task has made a school bus protection device that has comprehensive protection to the commute. The device has real time following, student identification, delays, and scholar absence. This paper introduces the student tracking system in school bus using face recognition and IoT. This system is very useful and efficient to track the student tracking system in school bus.

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