Automated Access Control System Using NFC and Ultrasonic Sensors

Project

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SUBMITTED TO

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APPLICATION :

This project is suitable for environments such as secure facilities, schools, or workplaces where automated access control enhances security and operational efficiency. By combining height detection with RFID authentication, the system ensures that only authorized personnel meeting height criteria can gain access, reducing the risk of unauthorized entry.

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Functionality:

The system operates by first measuring the height of individuals using the ultrasonic sensor. If an individual meets the height criteria (above 100 cm), they are prompted to present an NFC card.

The RFID reader verifies the card's UID against a predefined list of authorized users stored in the system.

Upon successful authentication, access is granted, accompanied by an audible confirmation through the buzzer and real-time notifications via Bluetooth.

Access denial triggers a different buzzer tone and notification.

Components Used:

- **MFRC522 RFID Reader:** Interfaces with RFID cards to authenticate authorized personnel.
- **Ultrasonic Sensor (HC-SR04):** Measures the height of individuals approaching the access point.
- **Arduino Uno:** Controls and processes data from the sensors and RFID reader.
- **Bluetooth Module**: Facilitates wireless communication for real-time status updates.
- **Buzzer:** Provides audible feedback indicating access approval or denial.

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