

Invigilation Robot

https://www.youtube.com/watch?v=eh8c0pr_Sjc

The aim of this project is to develop a robotic system for invigilating examination halls and reducing the dependency on human invigilators. In conventional schools and colleges, students are required to attend physical examination centers where invigilation, student authentication, examination paper distribution, and monitoring are generally performed manually. The proposed system utilizes modern technologies to make the examination process more automated, efficient, and intelligent. The robot is designed using a PIC microcontroller, fingerprint module, buzzer, LCD display, DC motors, ultrasonic sensor (HC-SR04), IP camera, and voice announcement system. When the robot enters the examination hall, it verifies the identity of each student using the fingerprint authentication module. If the authentication fails, the system immediately generates an alert through the buzzer to notify the administrator. Once the student's fingerprint is successfully verified, the robot distributes the examination paper and announces the authentication status through the voice system. After completing the authentication and paper distribution process, the robot monitors the examination hall using the IP camera until the completion of the examination. The complete system status is displayed on the LCD. The robot is driven using DC motors, and the HC-SR04 ultrasonic sensor detects obstacles in its path and automatically changes the robot's direction to avoid collisions. Thus, the proposed robotic examination invigilation system provides an efficient, intelligent, and automated solution for student authentication, examination paper distribution, surveillance, and obstacle avoidance while reducing human effort and minimizing the possibility of examination-related errors or paper misplacement.

The main objectives of the project:

- Using of Wi-Fi wireless communication to monitoring with Ip camera.

- Finger print module-based authentication system.
- Obstacle detection using SR04 sensor.
- Audible alert through buzzer in case of wrong fingerprint.
- DC motors for robot moving.
- Visible alert using LCD display.
- Design of efficient invigilation robot.
- No need manpower.

The major building blocks of this project are:

- Battery Power supply.
- PIC Micro controller.
- LED Indicator.
- LCD display with driver.
- SR04 sensors.
- DC motors along with driver.
- IP Camera.
- Fingerprint module.
- Buzzer.
- Crystal oscillator.
- Reset button.

Software's used:

1. PIC C compiling and dumping code into Microcontroller.
2. Express SCH for Circuit design.

Block Diagram:

