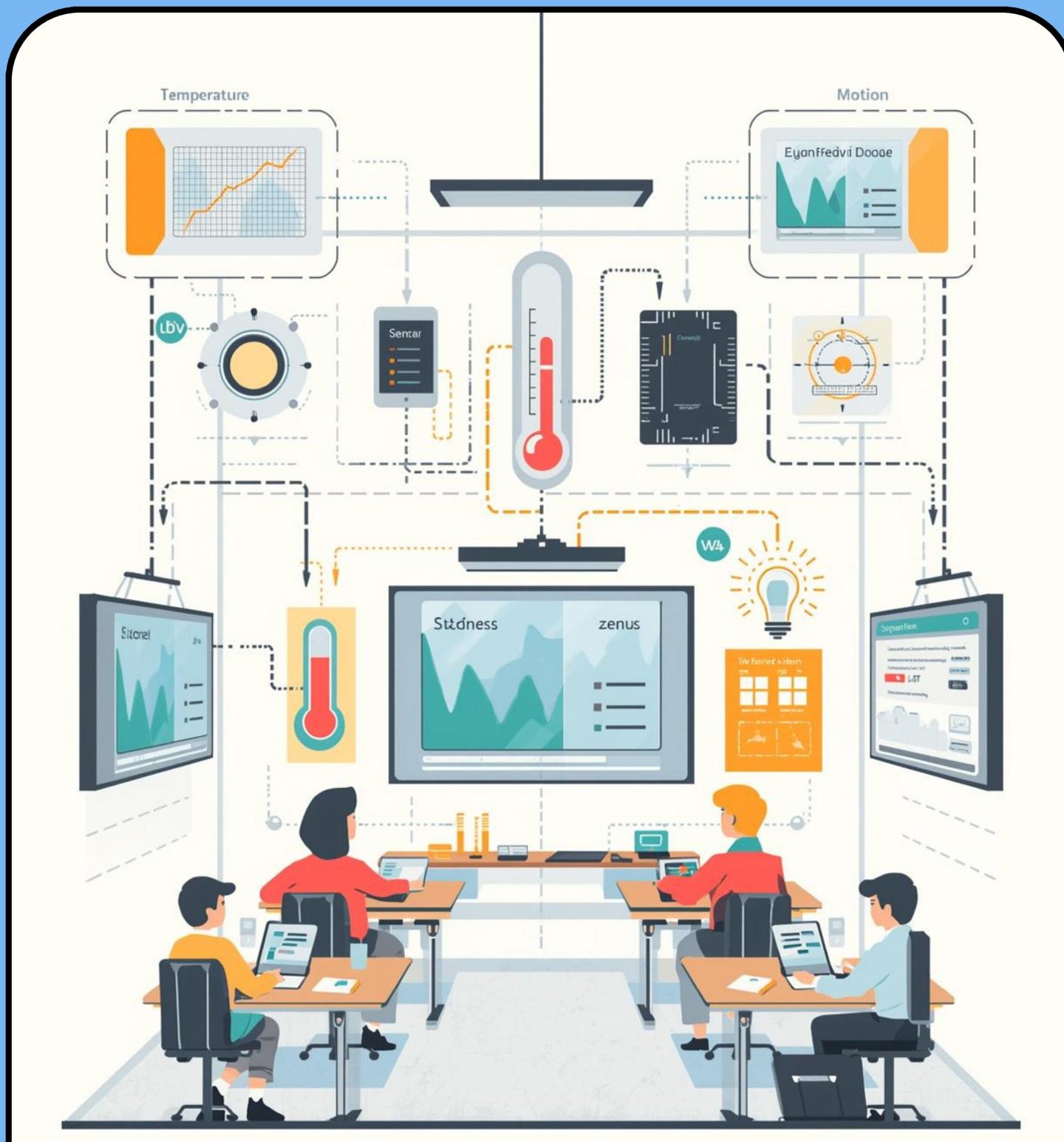


STUDENT PROJECT OVERVIEW

Smart Classroom System

by [Your Name Here]





Project Overview

- Implements a Smart Classroom monitoring system using ESP32, PIR, and LDR sensors.
- Utilizes the Blynk IoT platform and a custom web dashboard for real-time data visualization and control.
- Enables real-time tracking of student presence, presentation engagement, and performance feedback.



Key Features

Student Activity Monitoring

Detecte student presence using PIR sensors and presentation activity using LDR sensors

Blynk Integration

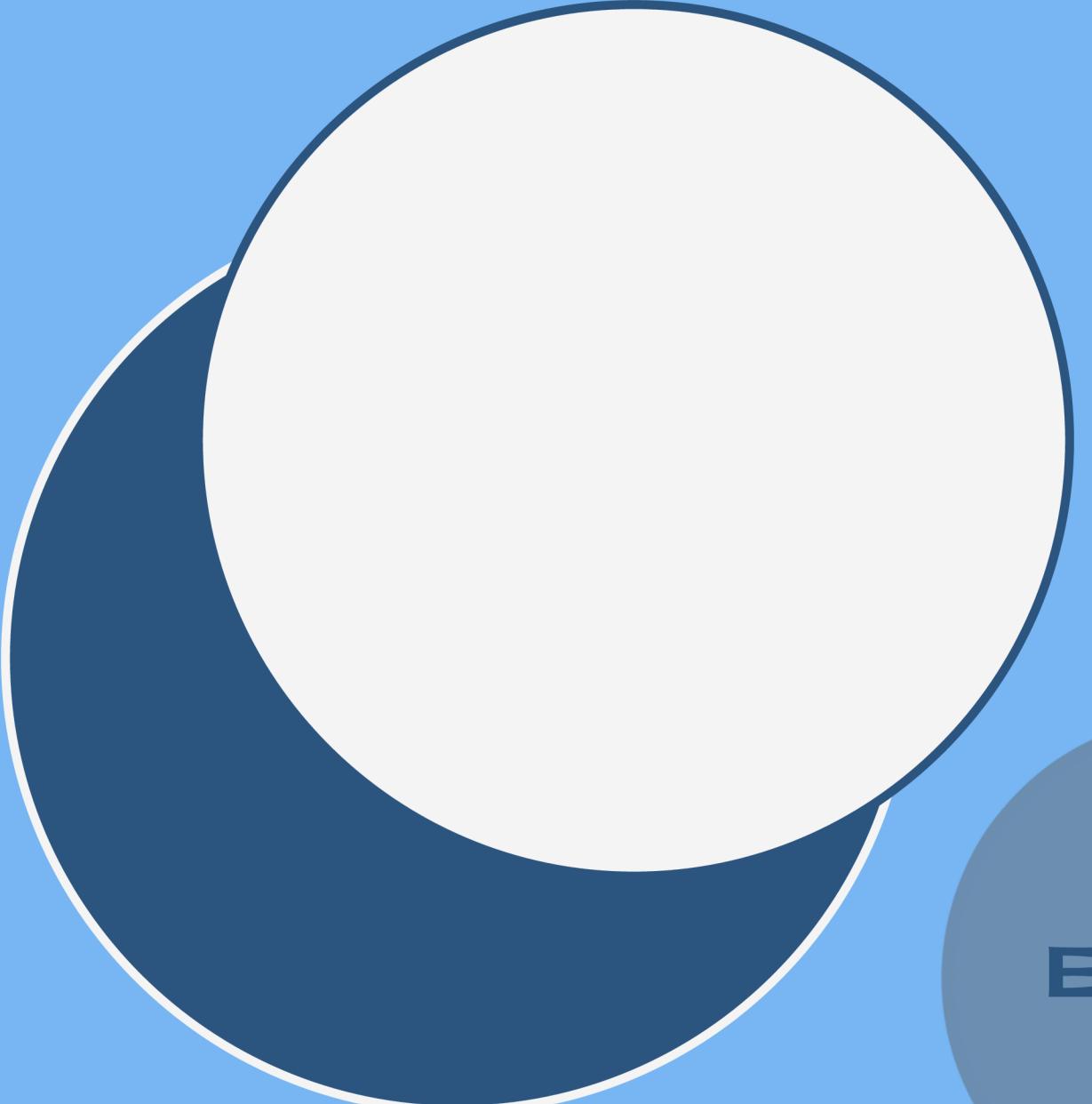
Visualizes and controis session data via a mobile app, allowing for remote monitoring and adjustments

Feedback & Analytics

Generates feedback and engagement scores per student providing insights into individual performance

Web Dashboard

Custom web page displays real-time stats, feedback, and charts for comprehensive classroom overview



Main Components & Architecture

ESP32

PIR

LDR



Smart Classroom Benefits: Enhanced Learning

Increased Student Engagement
Interactive tools and real-time feedback
promote active participation.

Real-time Feedback and Assessment
Teachers can instantly assess student
understanding through live quizzes and
assessments



Technical Implementation: **Sensors**

PIR Sensor (Pin 34)

Detects infrared radiation changes caused by movement. Triggers an event when motion is detected, indicating student presence.

LDR Sensor (Pin 35)

Measures ambient light levels. Used to detect projector usage during presentations.



Understanding HTTP Communication in Smart Classrooms

The Smart Classroom System utilizes HTTP communication to enable data exchange between controller and the Blynk app, and web page efficiently.



Blynk App: User-Friendly Interface for Smart Control

The Blynk app allows users to monitor and control classroom sensors in real-time, enhancing learning experiences.

V2 (V_SELECT_STUD): For selecting a specific student.

V3 (V_ACTIVE_STUD): Indicates the number of active students.

V5 (V_STUDENT_PIR): Displays PIR sensor data for a selected student.

V6 (V_PROJECTOR): Shows the status of the projector (LDR sensor data)

. V_PRES_TIM: For presentation timing.



Visualizing Classroom Data with a Web Dashboard

The web dashboard displays real-time data from sensors, providing intuitive insights into classroom conditions and activities.

Key Features of the System



Real-time Detection

sensors sense real time student presence and Projector presence.



Blynk App

Used to visualize sensor data, control classroom elements, and provide feedback.



Data Logging

Store and analyze classroom performance metrics, and display results on a web page.



Conclusion

This Smart Classroom project provides an interactive, sensor-driven evaluation system for teachers, combining mobile and web dashboards for optimal accessibility. The code can be customized for different environments by adjusting student data, sensors, and UI.