Project Title: Employee Attendance Tracking System with AI & CCTV Integration

Problem Statement:

Traditional attendance tracking methods are outdated and plagued with issues:

- Inaccuracy: Manual methods are prone to errors, leading to incorrect records.
- Time-Consuming: They waste valuable time on data collection and entry.
- Lack of Real-Time Info: Delayed information hinders quick decision-making.
- Data Security: Paper records can pose privacy risks and are hard to secure.
- Resource-Intensive: Consumes paper, storage space, and administrative resources.
- Limited Analysis: Lacks in-depth reporting and analytical capabilities.

Solution:

Modern automated attendance tracking systems offer **accuracy, efficiency, real-time data, security, cost savings, and advanced reporting**.

Project Objectives:

1. **Real-Time Tracking:** Implement a system for tracking attendance in real time, ensuring accurate and up-to-the-minute data of In and Out.

2. **AI Facial Recognition:** Utilize cutting-edge AI technology to enable facial recognition, enhancing security and convenience.

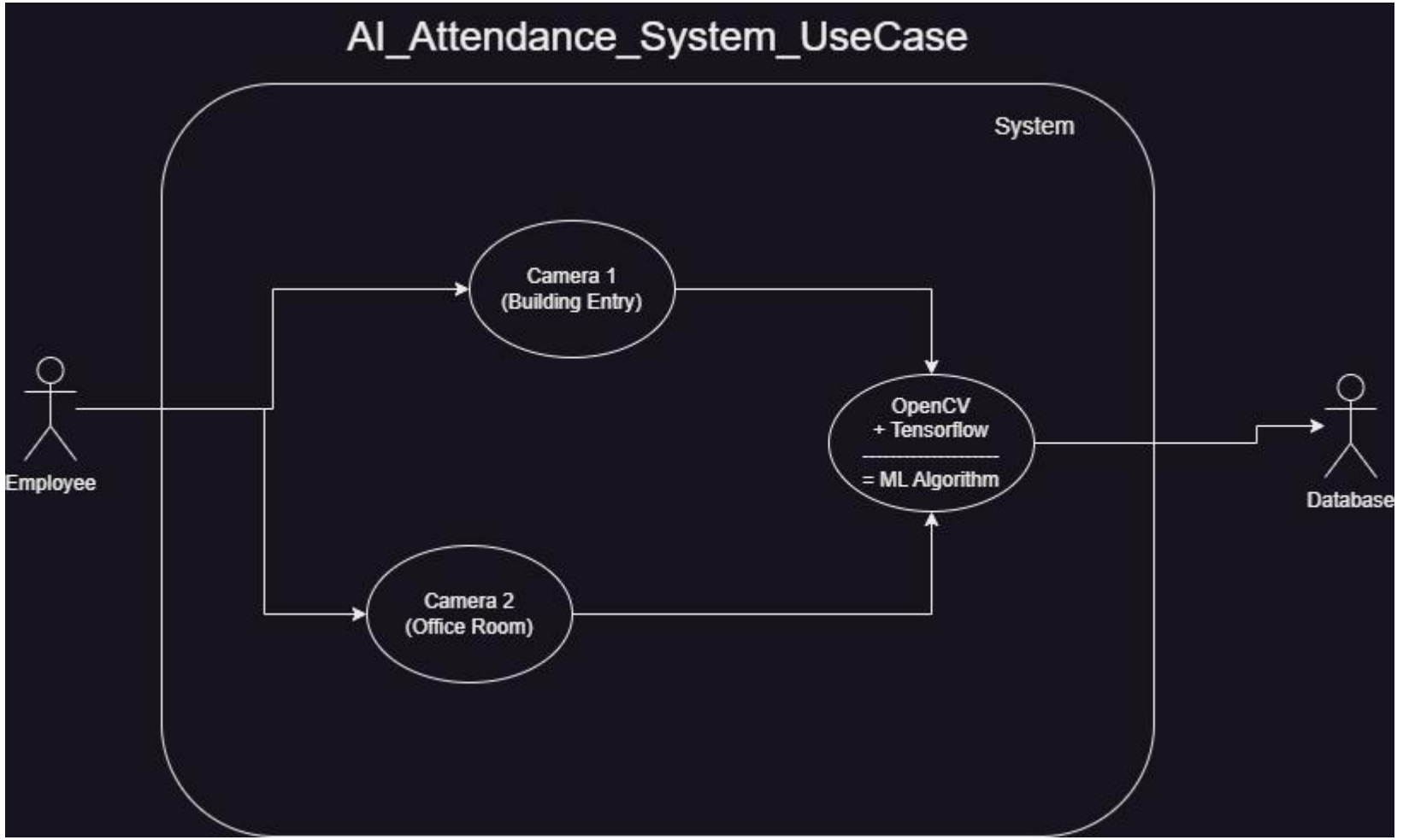
3. **Integration with CCTV:** Seamlessly integrate with existing CCTV camera systems to maximize efficiency and minimize additional hardware costs.

4. **User-Friendly Interface:** User-friendly interface for easy adoption by both staff and management.

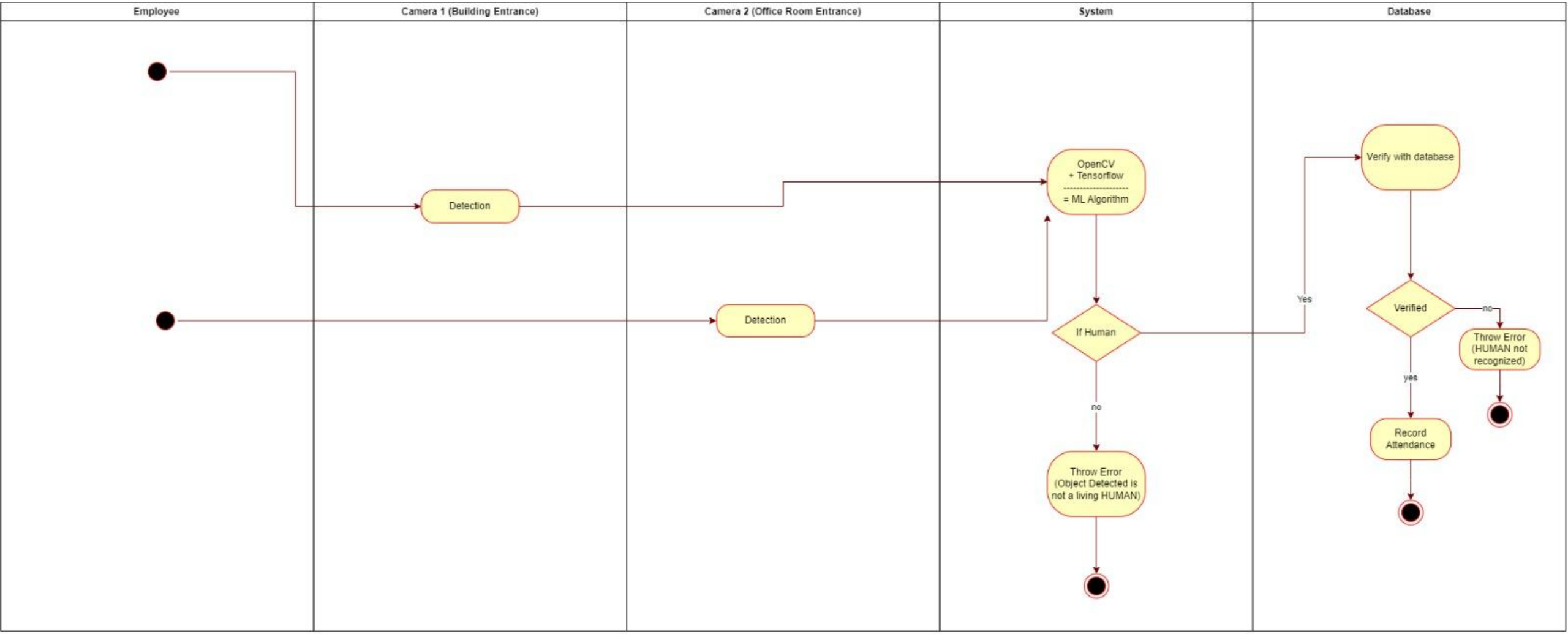
Components Used in custom hardware

ESP32 - CAM

Data Flow Diagram



UML Diagram


Employee
Camera 1 (Building Entrance)
Camera 2 (Office Room Entrance)
System
Database
Detection
Detection
OpenCV
+ Tensorflow
= ML Algorithm
If Human
no
Throw Error
(Object Detected is
not a living HUMAN)
Yes
Verify with database
Verified
no
Throw Error
(HUMAN not
recognized)
yes
Record
Attendance

System Components and its Use case

- CCTV Cameras:

- Real-time person detection.

- Two cameras: One at the main building entrance and the second at the office area entrance.

- Modules:

- Utilizes OpenCV and TensorFlow for advanced image processing and recognition.

- Database:

- Data storage options include **Google Sheets**, **PostgreSQL**, or **Firebase** for flexibility and scalability.

- User Interface:

- Accessible via a **user-friendly application** or custom **hardware installations**.

Real-time Tracking:

The system comprises two cameras:

1. The first camera is responsible for employee **check-in**.
2. The second camera monitors employee **check-out**.

These cameras employ **image recognition and facial expression analysis**, cross-referencing data with the employee database to ensure accurate tracking.

Features

1. **Real-time Tracking**:
   - Importance: Immediate, accurate data for swift decisions.

2. **Facial Recognition**:
   - Advantages: Convenience and heightened security.

3. **Attendance History**:
   - Accessibility: Easy access for employees to review records.

Integration with CCTV Cameras

Integration Process:

1. **Camera Placement:** Position cameras at key locations, e.g., building entrance and office area.

2. **Connect to Network:** Ensure cameras are connected to the local network or cloud with Algorithm.

3. **Testing:** Verify integration by testing real-time tracking and facial recognition.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QUESTIONS?

Thank You