Automatic Attendance

With facial recognition

Yassine Bendimerad

Introduction

Face Recognition Attendance System -

This project implements an automated attendance system using facial recognition on a Raspberry Pi with Python, OpenCV, face-recognition library.

It is Fast - Efficient - Reliable
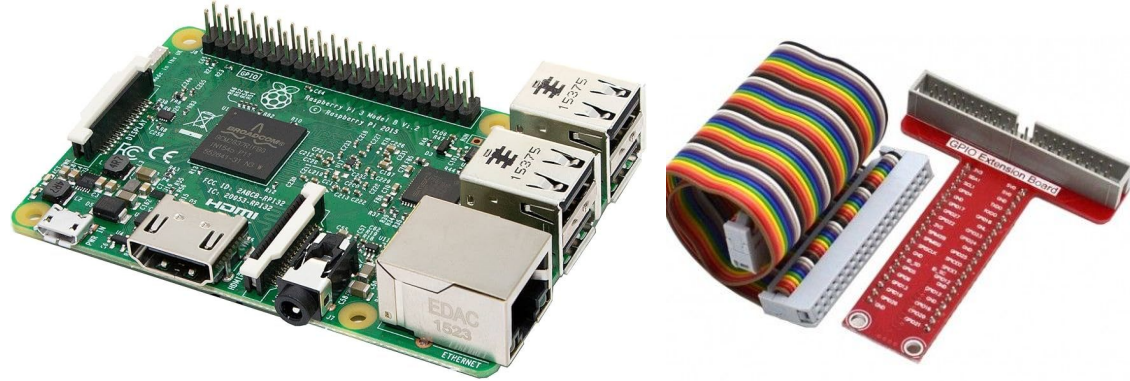
Here is a breakdown of its functionality:

Core Components

Raspberry Pi with camera

LCD Display (16x2)

Buzzer for audio feedback

GPIO pins for LCD and buzzer control

Software Architecture

Face recognition using face_recognition library

OpenCV for image processing

Excel-based attendance tracking

LCD interface for user feedback

Key Features

Loads known faces from a 'faces' folder

Processes video frames in real-time

Supports both Raspberry Pi Camera and USB cameras
Supports both graphical and console mode

Scales images for efficient processing

Compares detected faces against known face encodings

Attendance Management

Creates and maintains Excel workbooks

Organizes attendance by class names

Records timestamp for each attendance mark

Prevents duplicate attendance entries

Supports multiple classes and dates

User Interface

LCD display shows system status and confirmations

Buzzer provides audio feedback for successful recognition

Optional visual display showing recognition results

Console mode support for headless operation

Dependencies

Raspbian OS-64bit

CV2   -   opencv-python

face_recognition python library

xlwt, xlrd, xlutils for excel handling

Workflow

Initialization: System checks for available display
Initializes camera and LCD
Loads known faces from storage
Sets up Excel workbook for attendance

Main Operation: Continuously captures frames from camera
Processes every other frame for efficiency
Detects and recognizes faces
Marks attendance for newly recognized individuals
Provides feedback through LCD and buzzer

Attendance Recording: Creates new sheets for different classes
Updates existing records with timestamps
Saves attendance data in Excel format
Handles both new and existing student entries

Conclusions

My system provides an efficient, automated solution for attendance tracking, combining facial recognition technology with practical implementation for educational use (or organizational use by replacing "student" with "employee").