

Attendance Management System Using Raspbian Operating System

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Abstract - Signature and fingerprint are the most general method followed in attendance management in all most all the organizations. In this method the employees will poll their attendance either by signing in an attendance register or by scanning their fingerprint in an biometric device. This method may consume individual's time standing in the queue for polling their attendance which certainly reduces their work productivity and time. Attendance management using face recognition may be the solution for this to optimize the long queue and to save time of the employees. Here logic based attendance management automation algorithms are used to improve the attendance automation in organizations. This project is done with Open Source Computer Vision Library, is generally called the OpenCV. Raspberry Pi and Python are used for the backend process. OpenCV is designed for computing efficiency and a strong focus on real-time applications. It is perfect for real-time face recognition using a camera. In this project the combination of sensors, Raspbian OS to identify the user's face at various angles and implement the logical sensing algorithm is implemented.

Key Words: Attendance Management, Raspberry Pi Camera, Raspbian OS, Automation, HR Management.

1. INTRODUCTION

As technology gets advanced with time, electronic devices and internet it became more popular, efficient and affordable, So the concept of making attendance management system in organizations has changed dramatically into Modern attendance management system like fingerprint sensors, id card swiping brought new security challenges to the attendance management in organizations. The concept of attendance automation security has also evolved with time, sensors and actuators were integrated into the system to detect, alert and record proxy in the database. In the past, most of the organizations had an attendance register or an electronic system with a fingerprint sensor to scan, recognize and mark attendance in the organization's database to calculate the overall attendance percentage of the employee. This paper proposes that using raspberry pi the device can recognize the face of the people and connect and identifies with its database to manipulate the attendance. This will reduce the time of the employees standing in the long queue for attendance instead the employees can directly walk into their work. The device scans their face and marks the attendance in the database.

1.1 Literature Survey

This innovative system transparently unifies Various smart sensors and wireless communication technologies. This gradually forms a complex system to process various tasks. Developing this trend, we suggest a new intelligent attendance system based on a Raspbian OS. It can integrate various physical sensing information and control various information, this paper introduces the proposed attendance management automation that provides analytical services For the organization.

1.2 Existing System

The existing system of attendance management was done manually. One method was using a register book where employees of the organization have to stand in a long queue and enroll in the register book. This method consumes more time and it is complex to calculate the overall analytic of the attendance register. One person has to manually calculate the attendance percentage of the employees. To make it efficient and development of the technologies in the upcoming day's organizations came up with a device which could scan and recognize the fingerprint of the employees and it enrolls it in the organization's database. It overcame the manual process of counting the attendance percentage of the employees but failed to solve the waiting time in the long queues. This consumes the productive time of the employees and also there is a possibility for security breaches.

1.3 Proposed System

Every person, as well as the management of the organization who is experienced in the existing system, may think of a system that may add more flexibility to eliminate the wait time and security threats. These works are designed in such a way that it solves both the employee as well as the management of the organizations. The proposed system must be installed at the entrance of the office where employees get into the work. The connected device has a camera which has high accuracy in scanning the people's face. The scanned face is matched with the preloaded data which contains each and every employee's facial identity. This device also gives an instant lookup on how many employees are present inside the office. Analytic on Walk in and walk out over the time graph. This, in turn, reduces the wait time for attendance entry and also various insights on employee management.

2.1 Raspberry Pi

Raspberry Pi is minimal effort, fundamental PC that was initially expected to help goad enthusiasm for figuring among school-matured kids. The Raspberry Pi is contained on a solitary circuit board and highlights ports for: HDMI. Indeed, even the product, by prudence of being open-source, offers an open door for understudies to investigate the basic code - on the off chance that they wish. The Raspberry Pi is accepted to be a perfect learning apparatus, in that it is modest to make, simple to supplant and needs just a console and a TV to run. These equivalent qualities likewise make it a perfect item to kick off figuring in the creating scene.



Fig -1: Raspberry Pi OS

2.2 SD Card

The SD card is a key piece of the Raspberry Pi. It gives the underlying stockpiling to the Operating System and documents. Capacity can be stretched out through numerous kinds of USB associated peripherals. At the point when the Raspberry Pi is 'exchanged on', for example associated with a power supply, an exceptional bit of code called the boot loader is executed, which peruses increasingly unique code from the SD card that is utilized to fire up the Raspberry Pi. On the off chance that there is no SD card embedded, it won't begin. Try not to push in or haul out a SD card while the Raspberry Pi is associated with the power, as this is probably going to degenerate the SD card information (you may pull off it, yet it is best not to). The SD card must be designed, or written to, extraordinarily that implies the Raspberry Pi can peruse the information it needs to begin appropriately. In the event that you are new to this check the guidelines, or purchase a pre-organized SD card. One preferred standpoint to utilizing a SD card like this is you can have a few SD cards, each with an alternate working framework, or an alternate reason. Just power off, switch cards, and reconnect the power. You have an alternate PC to play with. If it's not too much trouble remember that the greatest throughput of the card per user of the Raspberry Pi is 25 MB/s and that in all likelihood read and compose speed won't surpass 22 MB/s.



Fig -2: SD Card

2.3 Pi Camera

The Raspberry Pi camera module can be utilized to take top quality video, just as stills photos. There are loads of models online of individuals utilizing it for time-pass, moderate movement and other video cunning. You can likewise utilize the libraries pack with the camera to make impacts. It joins by means of a 15cm lace link to the CSI port on the Raspberry Pi. It very well may be gotten to through the MMAL and V4L APIs, and there are various outsider libraries worked for it, including the Pi camera Python library. The camera module is prevalent in home security applications, and in untamed life camera traps. You can likewise utilize it to take previews.



Fig -3: Pi Camera

2.4 Open CV

OpenCV (Open Source Computer Vision Library) is a open source PC vision and AI programming library. OpenCV was worked to give a typical foundation to PC vision applications and to fasten the usage of systems observation in the business items. Being a BSD-authorized item, OpenCV makes it simple for organizations to use and change the code. The library has more than 2500. Upgraded calculations, which incorporates a far reaching set of both exemplary and best in class PC vision and AI calculations. These calculations can be utilized to distinguish and perceive faces, recognize objects, order human activities in videos, track camera developments, track moving articles, separate 3D models of items, produce 3D point mists from stereo cameras, fasten pictures together to create a high goals picture of a whole scene, and comparative pictures from a picture database,

expel red eyes from pictures taken utilizing ash, pursue eye developments, perceive view and set up markers to overlay it with expanded reality, and so forth. It has C++, C, Python, Java and MATLAB interfaces and backings Windows, Linux, Android and Mac OS. OpenCV inclines for the most part towards continuous vision applications. There are more than 500 calculations and around 10 fold the number of capacities that help those calculations. It is effectively conveyed in android programming by including it as a library of picture handling capacities.

3. CONCLUSIONS

Nowadays, a real demand to make attendance automation smarter in order to face challenges - i.e., manual entering in the register, wait time, security loopholes in the current solution. setting, one key job is played by the Internet of Things also, it's information streams that can be changed over into important Information used to address the above issues. According to this vision, the number of IOT solutions is, nowadays, Expanding, yet then again, those activities are independent and dependent on various conventions and norms. This paper deals with these problematic issues, by introducing an abstract virtualized layer that operates across multiple IoT architectures and platforms. This layer represents the end-point services by which it is possible to monitor, visualize, and control all the operations.

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