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Raspberry-pi Based Face Identification Attendance System

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Abstract - *Now days, many industries, organizations, university, colleges are using some technology such as RFID, Iris recognition, Fingerprint identification is used for taking their employs, students' attendance. Among of all this technology face recognition is most natural, less time is taken and highly efficient one despite being difficult to implement, a continuous observation for overcoming it. It has several applications in attendance management systems and security systems. In this work, a system is implemented that takes attendance for students as well as employees etc., by using this technique i.e. face detection and recognition technology. A fix time period is set for scanning their faces and taking attendance and the database is automatically uploaded into the web server through the internet connectivity by using this technique. The main advantage of this technique is, this process is done without any human intervention. In the project a Raspberry Pi installed with OpenCV library and a Raspberry Pi Camera module is connected for facial detection and Recognition. The hole data is stored in the memory card connected to Raspberry Pi controller and it can be accessed or control through the internet. The results show that a continuous observation increases accuracy of this project and maximizes the output*

Key Words: RFID, face recognitions, detection accuracy, OpenCV

1.INTRODUCTION

In the current systems or technology that are used for taking attendance automatically are usually RFID based, Bio-metric based and MATLAB based. Among this, the manual method of taking attendance is slightly difficult and it takes lot of time to process. So that it is important to construct an efficient and easy method or system for managing attendance automatically. Another advantage of these types is that it doesn't take fake attendance. Open Command Visualization (Open-CV) is an open-source library in which the source code is open and it is useful in visual field such as image processing. The main motto of this hole work and manage attendance using face recognition

1.1Literature Survey

Regular attendance marking is a standard and important practice for student performance checks in schools and colleges. Traditionally, the faculty work manually to ensure attendance in the classroom, which is time consuming, many attendance management systems are introduced in the market to track the attendance of the student earlier attendance marking method focused on RFID system, Raspberry pi punch systems. Swipe card system, fingerprint recognition. Old practice attendance systems are fairly inefficient todays to keep track of student attendance. Overcoming this can be made easier by using face recognition and face detection methodology, it can be rendered in a smarter way. With the implementation of this attendance scheme, it will become impossible for the students to skip classes without the knowledge of the staff. Problems of student to skip classes without the knowledge of the staff. Problems of student unintentionally marked present though being absent and proxies can be resolved.

After referring many available research papers, some of the related research paper that we were referred are given below

M Patil, Dr. Satish R. Kolhe, Dr. Pradeep M. Patil (2009), "Face reorganization by PCA technique"

Dr. Kishor S. Kinage performed Linear subspace analysis schemes (PCA, ICA LDA) for face recognition and represented his idea in Computer Science and Information Technology (ICCSIT), 2010 3rd IEEE International Conference. In this paper a multi-resolution analysis based on Independent Component Analysis (ICA) for face recognition is examined. [1]

Prof.Khairnar P.N., Prof.Khairnar N.K., (2018)," The present operating system and their future with reconfigurable architecture "Proceeding for national conference Advance design and Optimization techniques in Engineering applications, ISBN 978-5291-276-6

Prof. P.N. Khairnar1, Akshay R. Pagare2, Sagar R. Sonawane3, Pravin K. Walzade, (2017), Smart Street Light on Controlled System, International Journal of Advance Research and Innovative Ideas in Education, Vol-3 Issue-2, PP-1200-1204

1.2Component specification

- **Raspberry-pi camera module**

Description: RPi Camera (C) is a Raspberry Pi compatible camera module with fixed-focus, supports all revisions of the Pi. It works on a 5-megapixel OV5647 sensor in a fixed-focus module powerful enough to capture stills in 2592 x 1944 resolution. Supports 1080p30, 720p60 and 640x480p60/90 video recording.

Features:

Supports all revisions of the Pi
5 MP OV5647 sensor
Fixed-focus
72.4 degrees of view angle
2592 × 1944 still picture resolution
Support video recording on 1080p30 and lower standards

Dimension: 25mm x 24mm x 9mm.

- **Raspberry pi 3 B+ with 1.4GHz Quad core processor**

Description: Has a faster 64-bit 1.4GHz quad core processor, 1GB of RAM, faster dual-band 802.11 b/g/n/a wireless LAN, Bluetooth 4.2, and significantly faster 300Mbit/s ethernet. The Raspberry Pi 3 B+ has four built-in USB ports that provide enough connectivity for a mouse, keyboard or anything else that you feel the RPi needs. On top of all that, the low-level peripherals on the RPi make it great for hardware hacking. The 0.1" spaced 40-pin GPIO header on the RPi gives you access to 27 GPIO, UART, I2C, SPI, as well as 3.3 and 5V sources. Each pin on the GPIO header is identical to its predecessor, the Model 3. The GPIO header remains the same, with 40 pins, as on the previous three models of Pi.

Features of Raspberry pi 3 B+:

- Faster 64-bit 1.4GHz quad core processor
- Faster 300Mbit/s ethernet
- Bluetooth connectivity
- Extended 40-pin GPIO Header
- Dual-band wireless chip (CYW43455) with 802.11 b/g/n/ac wireless LAN and Bluetooth 4.2
- The dual-band 2.4GHz and 5GHz wireless LAN enables faster networking with less interference
- Video/Audio Out via 4-pole 3.5mm connector, HDMI, CSI camera, or Raw LCD (DSI)
- Storage: microSD
- Gigabit Ethernet over USB 2.0 (maximum throughput 300Mbps)
- Low-Level Peripherals:
  27x GPIO
  UART
  I2C bus
  SPI bus with two chip selects
  +3.3V
  +5V
  Ground
- Supports Raspbian, Windows 10 IoT Core, Open ELEC, OSMC, Pidora, Arch Linux, RISC OS and More!

Specifications of Raspberry pi 3 B+:

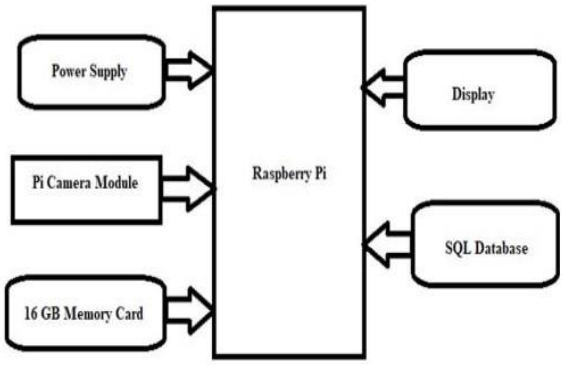
- Processor: Broadcom BCM2837B0 64-bit ARM Cortex-A53 Quad Core Processor SoC running @ 1.4GHz
- Memory: 1GB RAM LPDDR2 SDRAM
- Connectivity:
  2.4GHz and 5GHz IEEE 802.11.b/g/n/a wireless LAN, Bluetooth 4.2, BLE
  Gigabit Ethernet over USB 2.0 (Maximum throughput 300 Mbps)

4x USB2.0 Ports with up to 1.2A output

- Video and sound:
  1 x full size HDMI
  MPI DSI display port
  MPI CSI camera port
  4 port stereo output and composite video port
- Input power:
  5V/2.5 ADC via micro-USB connector
  5V DC via GPIO header
  Power over ethernet (POE) enabled
- Operating temperature: 0 - 50C

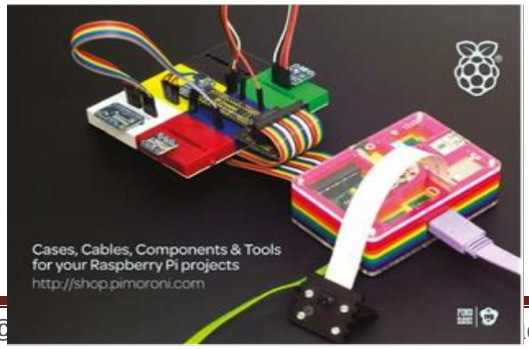
2. design

In this it contains block diagram of raspberry-pi base face Identification attendance Attendane monitoring system using Raspberry pi.
The elements of block diagram of face recognition based attendance monitoring system using Raspberry pi are also explained



Block diagram

PROPOSED MODEL:
The final model is used for taking attendance by using face recognition and managing the in various fields like colleges and offices etc. The final architecture is shown in below Figure. Raspberry Pi Camera Module V2 attached to Raspberry Pi3 and it is placed where the people enter the office. Camera Module is used to capture video form



Detecting Faces:

Choosing an efficient algorithm for face recognition is critical in this proposed work. There are many face detection algorithms available in OpenCV such as Eigenfaces, Fisher faces and Local Binary Pattern Histograms. Considering the need for the real-time recognition an algorithm which has been opted is the Has Cascade Algorithm For face detection and recognition. It is available in OpenCV source library and has proved to be robust

3. CONCLUSIONS

Thus, this face recognition attendance system cam thus be proved to be secure and efficient. In real time scenarios, it is very useful and found to be suitable for implementation of this work.
It gives a better recognition rate with a low false rate. Using raspberry-pi independently improves the mobility of the work and it cats as a standalone hardware.
The work can be further developed by improving recognition rate and by using raspberry pi infra-red camera module this system can be used as a security surveillance

REFERENCES

1) G. Lakshmi Priya, M. Pandima devi, G. Ramu
2) Priya, 2014, International Journal of Advanced Research in Computer and Communication Engineering

3) M Patil, Dr. Satish R. Kolhe, Dr. Pradeep M. Patil (2009), "Face reorganization by PCA technique"

4) Mahesh, R. and Vinod, A.P. (2006), "A New Common Subexpression Elimination Algorithm For implementing Low Complexity FIR
5) Filters in Software Defined Radio Receivers", Proceedings of the IEEE International Symposium on Circuits and Systems, Vol. 4, pp. 4515-4518.

6) Punam K. Jadhav1, Shivani S. Deshmukh2, Prerana N. Khairnar3 (2019)," SURVEY PAPER ON AgRo-Bot AUTONOMOUS ROBOT", International Research Journal of Engineering and Technology (IRJET), Volume: 06 Issue: 12, pp.434-441.

7) 1P. N. Khairnar, 2N. K. Khairnar, (2018)" Implementation of Effective Integrated On-Chip ESD Protection in Nanoscale CMOSregime for RFIC",

Proceedings of WRFER International Conference, 29th April, 2018, Hyderabad, India, pp-5-9.

8) Prof.P.N. kKhairnar1, Shruti P Badhan2, Shital B Nimse3, Ankita V Malve4, (2018), AGROBOTS, International Journal of Advance Research and Innovative Ideas in Education (IJARIIE), Vol-4 Issue-2, pp-3399-3404.'

9) Khairnar Prerana, Pankaj Gopal, Pooja Jadhav, (2018), ELECTRONIC TICKETING MACHINE WITH SMART CARD, International Journal of Computer Engineering and Applications, Volume XII, Special Issue.

10) Prof.Khairnar P.N., Prof.Khairnar N.K., (2018)," The present operating system and their future with reconfigurable architecture "Proceeding for national conference Advance design and Optimization techniques in Engineering applications, ISBN 978-5291-276-6.

11) Prof.P.N. Khairnar," Future Trends in Fiber Optics Communication", International Journal of Engineering, Education and Technology (ARDIJEET), ISSN 2320-883X, Volume 05 Issue 02, 01/04/2017.

12) Prof. P.N. Khairnar, Kokane Harichandra J., Narkhede Amol A., Narkhede Kunal A, (2017), Industrial Device Control Using Android Mobile & Bluetooth technology, Vol-3 Issue-2, PP-2470-2479.

13) Prof. P.N. Khairnar1, Akshay R. Pagare2, Sagar R. Sonawane3, Pravin K. Walzade, (2017), Smart Street Light on Controlled System, International Journal of Advance Research and Innovative Ideas in Education, Vol-3 Issue-2, PP-1200-1204

14) Prof. Autade P. P1, Prof.Gaikar M. R2, Prof.Khairnar N.K., (2016)" A Survey on Public Auditing for Shared Data with Efficient User Revocation in the Cloud", International Journal of Innovative Research in Computer and Communication Engineering, VOL-4, ISSUE-2.

15) Prof.S.G. Galande and P.P. Autade, (2015)" An Embedded 1/3 Phase Automatic Transfer Switch with Intelligent Energy Management" International Journal of Computer Engineering and Applications, Volume IX, Issue V, P9-14