Monitoring and Controlling of an Auditorium
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Abstract:
The development of the new technologies in the area of electronics has brought tremendous changes in the day to day life of human being. In new technology, automated systems are more preferable than manual system. The power monitoring and controlling of electric equipments are developed using developed technology. Currently, it is required to avoid wastage of power. A Raspberry-pi3 is designed for controlling the equipments and monitoring systems. Automatic power controlling and monitoring system is designing for making an auditorium’s lighting system as well fans easily controllable and monitoring. Raspberry pi3’s camera will detect the persons with help of face detection, which are seating in the auditorium along with their location. The fans and lights will be automatically turn ON in auditorium after detecting number of persons seating with their respective location. Raspberry-pi3 supports python language. Raspberry-pi3 is implemented on NOOBS Operating System using python language. Now days, Multi-Block Local Binary Pattern (MB-LBP) is useful method which is used for face detection of persons. MB-LBP is required to implement on the Raspberry pi3 to detect faces of humans for extraction of attributes of faces. This is effective method to control the no of electric equipments and to reduce power consumption.

Keywords: Face detection, MP-LBP, Edge detection.

I. INTRODUCTION

Everywhere industry is developing new technology and trends. Therefore the research upon new invention is going on. Now a day’s power is most valuable thing. In large places such as auditoriums, halls and also industries, electric equipments like fans and lights are running, even if there are no people. Moreover, in some cases, some areas may be unfilled. But even in those areas, electric equipments are running meaninglessly. This occurs because, every time manually turning ON and OFF a fans as well as lights in accordance with the arrival of people in auditorium, is an uncomfortable task. This causes considerable wastage of power. To avoid this thing, as a precaution, fans and lights will be turned on prior to the arrival of people in auditorium. Hence this system that automatically controls the power supply of such places.

R- pi’s camera will detect the people seating in the auditorium according to their location. MB-LBP algorithm is implemented on the Raspberry pi3 to detect faces of humans using image processing. In image processing correlation is done. In this,Depending upon where people are seating in auditorium, automatically switch ON the fans and the lights near those rows only.

Temperature sensor LM35 is used to sense the temperature of the auditorium and this will sense the decrease in the temperature of auditorium. If temperature of auditorium goes below threshold temperature then and then only the fans will be switched OFF automatically to control temperature of auditorium. Thus the automatic controlling of the electric equipments in the auditorium is achieved and power Consumption is also made efficient.
All models feature a Broadcom system on a chip (SoC), which includes an ARM compatible central processing unit (CPU) and an on-chip graphics processing unit (GPU, a Video Core IV). To store the operating system and program memory, Secure Digital (SD) cards are used. The board has four USB ports, HDMI and composite video output and also phone jack for audio. Lower level output of GPIO pin supports common protocols like PC. The R-pi has Ethernet port. The Raspberry Pi3 includes three basic, powerful upgrades. It replaces the single-core, more powerful quad-core. The RaspberryPi 2 uses a 32-bit 900 MHz quad-core ARM Cortex-A7 processor. RAM of R-pi is 1GB and R-pi has four full USB ports. R-pi has Video Core IV 3D graphics core. Raspberry Pi has camera module. This camera module is called as R-pi camera. This camera interfaces with Raspberry pi3. The R-pi camera captures the image.

Design of the power supply

1) Determine the total current that the system sinks from supply.
2) Determine the voltage rating required for the different components.

The Power supply required for 

Voltage rating: 5V
Current rating: 2A

III. METHODOLOGY

A new feature, called Multi-block Local Binary Pattern (MB-LBP) feature, to represent facial image. MB-LBP encode rectangular regions by local binary pattern operator. Comparing with original Local Binary Pattern calculated in a local 3*3 neighborhood between pixels, the MB-LBP features can capture large scale structure that may be the dominant features of image structures. The MB-LBP is the simple difference rule in features is changed into encoding rectangular regions by local binary pattern operator. The LBP is defined for each pixel by thresholding the 3*3 neighborhood pixel value with the center pixel value. MB-LBP operator is defined by comparing the central rectangle’s average intensity with those of its neighborhood rectangles for encoding the rectangles. In this way, it can give us a binary sequence.

The MB-LBP operator gives output value,
IV. EXPERIMENTAL RESULT

This system reduces the wastage of electricity and power consumption also made more efficient. The power saving through this project can be implemented in real time applications and industrial time application.

V. MP-LBP RESULT

MP-LBP algorithm gives more accuracy. The output of LBP operator can be used as the feature value.

VI. CONCLUSION

Auditorium monitoring and controlling system is developed using parameter like temperature and human count by using Raspberry pi3. MB-LBP algorithm is implemented on the Raspberry pi3 for face detection of humans for extracting attributes of faces of people. This is one of the method which is effective to control the electric equipments and to reduce power consumption.

VII. REFERENCES


