RASPBERRY PI: A need of Data communication

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Abstract— In this changing world of global data communication, reasonable or low-priced internet connection and fast running software development, security has become the most important point of concern for human. The popularity of automation is increasing with every passing hour because of its uncountable benefits. The Raspberry Pi is a low-cost debit card sized single-board computer whose popularity is increasing with every single passing day.

INTRODUCTION

The Raspberry PI makes network security cost-effective and easy to implement. Raspberry PI can be used in many forms for better security as it is user friendly and is helping the technology world in many ways.
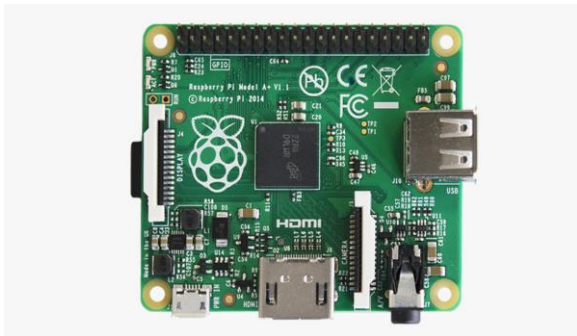
-HOME APPLICATION CONTROL SYSTEM

Smart Mirror using Raspberry PI

-Classroom Attendance Using Face Detection

HOME AUTOMATION ONTROL SYSTEM

Smart home contol device is an open-source wi-fi empower where everyone of the machines (fan,light,air-conditioner) are associated with raspberry pi board.

In the present smart city life everything is mechanized, to switch On the fan and to build the speed of the fan we need to do it physically. As we are utilizing the advanced mobile phone which will dependably with us decrease the utilization of remote control for controlling the home machines.

We are utilizing ubidots account in which switches are put which switches are put which in turns control the heaps and go about as our remote controller. We can utilize this in everybody's home, class, lobbies, assembly hall and long corridors where number of switches is more.

Design of Smart Mirror

At present more and more close to life of intelligent products are emerging, like smart TV, smart watches to now appear again intelligent mirror.

According to the survey, we spend most of our daily routine time on washing, makeup and dressing after getting up in the morning, and for us to time is also included in which we use mirror. In order to make full utilization of this time in the whole day; can effectively access the relevant information of the day, this project designed a kind of intelligent mirror can be used in the home of things.

Smart mirror equipped with intelligent voice control from any cast music, dialogue, broadcast an achieve full voice control. In the mirror on hot news, weather conditions, schedule and other clear, it also shows the clothing index according to real time, weather condition and reminder out of attention. At the same time, users can also control the brightness of the mirror lights through the mobile phone application, in my spare time, through the mobile phone application we can chat with the mirror.

CLASSROOM ATTENDANCE USING FACE DETECTION

In current scenario, attendance system is manual. It wastes a valuable amount of time both for teachers as well as students. The waiting time of the students increases if attendance is taken manually. There are still chances of proxies in the class when attendance is taken manually. Manual attendance always a have a chance of human errors. Face is the essential recognizable proof for any human. Due to this automating attendance process the productivity of class will increase rapidly. The Raspberry Pi 3 is chosen for face detection as it can be made possibly available in every platform. A Webcam is associated with the Raspberry Pi components. Face identification separates faces from non-faces and those countenances that can be perceived. This project can be utilized for various applications where face acknowledgment can be

utilized for validation. In this proposed system we take the attendance using face recognition which recognizes the face of each student during the class hours.

II. HARDWARE:

a) Raspberry Pi:

The Raspberry Pi is a debit card sized computer which is used in networking and computing operations widely all around the world. In the field of IoT it is the main element. It helps in the connection of automation system with remote location controlling device as internet is easily accessible.

In present day, there are various versions of Raspberry Pi, available.

b) Camera:

The ocular instrument which is used for capturing images, which can be stored locally and can be carried easily to any location is known as camera. The camera is a remote sensing device as it senses objects or subjects easily without any contact.

c) GPIO Pins:

General-purpose input/output (GPIO) is an uncommitted digital signal pin on an integrated circuit or computer board whose behavior-including whether it is an input or output pin-is controllable by the user at run time.

d) SD Card:

The OS required for Raspberry pi is raspbian and the minimum recommended card size is 8 GB.

e)Speech Sythesis Module Interface Circuit:

Smart Mirror Speech Sythesis module using the SYN6288 speech synthesis chip, the chip through asynchronous serial communication mode (UART), to be related to the text data synthesis received from the implementation of the text to speech.

f) Wireless Transceiver Circuit:

The wireless transceiver module is composed of the sending module and receiving module.The transmitting module is controlled by the external STM32 single chip microcomputer, and the receiving module is controlled by the STM32 microcontroller inside the mirror.

g)Display Interface Circuit:

The display function of the smart mirror is that the raspberry pi is connected to the VGA port of the display to drive the display through the HDMI to VGA transfer line.

III.SOFTWARE:

a) Python IDE:

Python is an easy to learn, powerful programming language. It has efficient high level data structure and a simple but effective approach to object oriented programming. It can be called an extended version of C and C++. It is an ideal language for scripting and rapid application development in various areas on most platform.

b) OpenCV:

OpenCV is a library of programming functions mainly aimed at real-time computer vision. It has a modular structure, which means that the package includes several shared or static libraries. We are using image processing module that includes linear and non-linear image filtering, geometrical image transformations (resize, affine and perspective warping, and generic table-based remapping), color space conversion, histograms, and so on. Our project includes libraries such as Viola-Jones or Haar classifier, LBPH (Lower Binary Pattern histogram) face recognizer, Histogram of oriented gradients (HOG).

A)   Image processing module

B)   Numpy

c) The Raspberry Pi Program Design:

The Raspberry Pi Program Design is a python based programming language which can be operated in the linux operating system.

d) Stm32 Program Design:

The Raspberry Pi configuration   software, using STM32F030C8T6 microcontroller serial port to read from the date, time and temperature information, and then displays on the display; when the detected someone close can also play a greeting; when using a mobile phone to send   APP voice recognition information to users of raspberry pi; raspberry pi through WIFI call SPI network interface, access to respond to information , and then sent to the STM32F030C8T6 micro-controller to control speech synthesis module SYN6288, to make it sound.

IV. CONCLUSION:

The successs of the Raspberry Pi has two important implications:

It's a harbinger for powers of the internet of Things.

It shows that radically inexpensive devices are good enough for many people and a lot of task.

Raspberry Pi has become something of a mascot for the IOT movement. Its been a catalyst for engineer's makers and startups to launch all kinds of new equipments. And its been used to power all kinds of things its creator never imsagined.

V.FUTURE SCOPE OF RASPBERRY PI:

The internet started with a simple idea of connecting computers together to share data in various ways.

From the day Raspberry Pi is launched its popularity is getting extended day by day. And in future also it is going to help mankind in many ways. As it can be easily access by everyone from security purpose to automated devices.

In the future, the Raspberry Pi will be surving the new technical era to the world. And this wonderful piece of hardware which will extend and very soon will bring new technical era to the users.

VI.REFERENCES:

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