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Design and Implementation of Multi Language Voice Control Industrial Automatic System Using Raspberry PI

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Abstract: *Internet of Thing (IoT) is very common and demanding nowadays and industrial automation system is not left behind in this technology. Industrial automation is the concept of making any industrial "smart". In this modern life, Automation is not a new thing. This technology has been using many years and normally can be seen in big companies. This automation concept can benefit our daily lives through many ways. However, the smart home technology in the market right now only support a few languages, generally English. For people who English is not their native language, it becomes a barrier in utilizing voice recognition installed in the smart industry. Therefore this project will develop a Multilanguage IoT Industrial Automation System that focused on people who does not speak English especially elderly people in India to perform their chores routine such as turn on or turn off industrial process by using voice commands given in their preferred language. Other than voice commands, it could be controlled wirelessly by using apps developed in the Smartphone. This system is based on Raspberry Pi and will be designed to be an affordable and reliable industrial automation system yet, easy to setup and use. The research focus on the methods of integrating voice recognition technology in many languages in home automation systems. This research can have a strong and positive impact to the society.*
Keywords: *multi language,Voice recognition,raspberry pi*

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I. INTRODUCTION

We will deliberate how to control home appliance, safety and society system using GSM technology by using android application through android mobile phone. we will also show that we can control the appliance even in the absence of an android phone by sending a normal SMS. Also for the safety system in case of fire or gas leakage it will report the owner by sending a SMS and also by ringing an alarm[1].This paper explains the speech recognition to provide the hi tech approach towards the goal that is to operate wheelchair with less efforts. We have to speak into the microphone and the Raspberry Pi B follows the commands and perform the operations on the DC motor. This paper presents the concepts of speech recognition implemented with the use of Hidden Morkov Model in an offline mode(without internet)while the available models come in online mode with the use of internet. In this way, a navigation framework for wheelchair in which integrates various alternative input interfaces where voice control is done with CMU Sphinx[2].The sensor data is transmitted to network coordinator which is heart of the wireless personal area network. In the modern scenario wireless networks contains sensors as well as actuators. ZigBee is newly developed technology that works on IEEE standard 802.15.4,Which can be used in the wireless sensor network (WSN).the low data rates, low power consumption, low cost are main features of ZigBee[3].The objective of project is to build a safety and security system that carries out various functions, like remotely controlling and checking to the banks like fire alarm, burglar alarm ete using Arduino Uno.and give information using website and GSM Module[4].The developed intelligent mirror system includes the weather information. time and location information,current event information,user information, and camera image taken from web services using Raspberry Pi 3 microcontroller card. Some equipment can be controlled by voice commands via the microphone on the smart mirror[5].The smart mirror is based on Raspberry Pi 3 B model, through facial recognition and speech recognition model, mirror can identify the user. Using Machine learning algorithms the mirror can give user recommendation to utilize his time more effectively[6].The objective of the undertaking was to make a smart mirror gadget that individuals could collaborate with yet in addition to additionally build up the innovation so it would allow you to introduce and build up your own applications for it. The Smart Mirror was created in four months, beginning with the product lastly incorporating it with the equipment[7]

II. PROPOSED SYSTEM

Google Assistant multi language voice recognition app is installed in smart phone.ESP 8266 wifi module is connected in the raspberrypi.DHT11 sensor measured in the temperature and humidity. Electromagnetic relay is connected by the heater and cooler. Temperature is increased and decreased using

heater controller. Humidity increase and decrease using coller controller. When the giving the voice command ,already codding the python programme, the programme was running. And pass the command to the Raspberry pi

III. HARDWARE REQUIREMENTS Raspberry pi

Raspberry Pi 3b Plus can do a lot and anything compared to a PC on a laptop and is the size of a credit card. It has a quad-core 1.2 gHz, 64-bit CPU, BCM 2837 RAM1GB Processor-Broadcom RAM

SENSORS

The PIR Sensor helps to detect movement within the sensors range. The sensor emits radiation which is split into two halves.The two parts are wired up with the goal that the counterbalance one another. In the even that one half observes an increased IR radiation than the other, the yield will swing to high [10]. A change in energy observed in the monitored area due to an intervention is recorded, '1' is sent to Raspberry Pi, else '0' is sent. PIR requires 5 volts and 50 mA current and it detects the movement up to 12ft, i.e., about 4 meters in a semi circular edge.

An IR sensor is an electronic gadget that produces infrared radiation to detect the objects in the surrounding. An IR sensor basically detects the warmth as well as the motion of an object. The IR sensor module comprises of the IR Transmitter and Receiver, Operational speaker, Variable Resistor (Trimmer pot). IR LED radiates light, in scope of Infrared recurrence. IR light is imperceptible to human vision as its frequency (700nm-1mm) is a lot higher than the VIBGYOR range. These kinds of radiations are not visible to human eyes and can be identified only by an infrared sensor.

The motion of an object generates a deformation that is measured using a piezoelectric pressure sensor. A Piezoelectric sensor delivers a voltage in response to some kind of physical pressure, for example, a thump or vibration. An LED will glow when a thump or vibration is identified. However, in fact, a vibration sensor is helpful when we need a circuit to be sensitive to delicate movements. The sound sensor is generally used to detect the intensity of sound. The application of this module mainly include home automation systems, consumer electronics, security systems and sound recognition systems. Comprising of a microphone and a processing circuitry this sensor is capable to determine noise levels or decibels at 3kHz to 6kHz frequencies approximately wherever the human ear is sensitive.

RASPBERRY PI CONTROLLER

The Raspberry Pi 2: Model B+ is a miniature sized single- board computer with a fast 1.2 GHz 64-bit quad-core ARM Cortex-A53 processor. It can control input gadget and it can interface sensor to get sensor information. It has 40 GPIO pin (General Purpose Input Output) to interface sensor. Model B is the higher specific variation of the Raspberry Pi, with 512 MB, of Ram, two USB ports, and a 100mb Ethernet port. It also has a slot for USB storage to save the proof and data. The processor collects the data from the PIR sensor, IR sensor, Piezoelectric sensor and the sound sensor.

IV. EXPERIMENTAL AND RESULT

The experiment includes an investigation on the accuracy and responsiveness of the system towards the command given by the user, in both control mode i.e., controller and voice command. Thenceforth, comparison between the proposed project and other related project is also conducted to emphasize the attribute of each system. The final product of the developed prototype is also presented in this section.

V. CONCLUSION

The intelligent mirror used here facilitates our lives by using smart Alexa. Here Alexa helps one to open the browser that will open voice commands to documents or posts. The luminosity of this clever mirror will simplify the mirror intelligently and conveniently with Alexa capability. In future, Alexa's skills can be altered to keep the smart screen smarter and more effective. For eg, we will use certain things in the mirror of your car to allow the driver to communicate with your mirror when driving without using the mobile phone.

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