Emerging Trends in Digital Transformation

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GLOBAL INDUSTRIAL PROCESS MONITORING THROUGH ZIGBEE COMMUNICATION USING RASPBERRY PI

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ABSTRACT: This paper proposes a framework for observing of worldwide mechanical procedure by means of a charge card estimated single board PC called raspberry pi based multi parameter checking equipment framework outlined utilizing RS232 and microcontroller that measures and controls different worldwide parameters. The strategy includes a solitary expert and more than one slave with remote method of discussion and a raspberry pi technique that can either work on windows or Linux working framework. The parameters that can be followed are voltage, temperature, and light force. The equipment configuration is finished with the surface mount gadgets (SMD) on a twofold layer printed circuit board (PCB) to lessened the measurements and toughen the force proficiency. The different fascinating elements are field gadget correspondence by means of USB-OTG empowered Android gadgets, on field firm product overhaul with no particular equipment and remote observing and control.

1. INTRODUCTION

Remote correspondence is exceptionally real idea and it plays an essential position in a considerable amount of enterprises of mechanization field. At present the machine of remote correspondence in modern robotization is expanding quickly. Information Acquisition systems with remote openness are in agreeable interest in industry and client applications. In a few purposes individuals had been supplanted through unmanned contraptions a decent approach to gather information and hand-off the data back to the base. A solitary individual can screen and even draw in with the proceeding with work from a solitary base station. Wi-Fi established modern mechanization is an essential inconvenience in our ordinary ways of life. The technique to remote system for Industrial capacities institutionalized this present day. Astute and reasonable computerizations of business strategies are profitable with a specific end goal to enhance framework efficiencies, convey top notch stock, and ensure convenience and precision of frameworks. Wi-Fi is relied upon to be presumably the fastest developing innovations inside the subject of system computerization division. For outlining the procedure we require faraway portable PC together with the Zigbee recipient. We put into impact a framework which is transportable, low expense and having less safeguarding by method for using Zigbee mechanical ability. Zigbee transmitter has been interfaced with our technique which is put in elite segments of businesses. As an outcome the status of unique sensors mounted at working area is observed at anyplace in the businesses. The reporting of this genuine time information like the framework plants are along these lines is of best use for future investigation.

2. LITERATURE SURVEY

Mrutyunjaya Sahani, [et.al, 2015] the design and development of a new smart monitoring and controlling system for kitchen environment in real time developed with comparative good architecture. As per explain in the paper proposes a new Raspberry pi based kitchen monitoring system through webpage with ZigBee based technology with detail. In the designed and implemented a compact wireless sensor network with internet capability of environment. System can monitor the status of kitchen and send email and/or an alert SMS via GSM network automatically to users with detail data. It has the capability to control through internet. With the subject of received email is read by the developed algorithm fed into Raspberry pi and then the system responds to the corresponding instruction with high security applicable . It has a variety of features such as energy efficient, intelligence, various low cost, portability and high performance. A concept of new technology used

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Raspberry pi based kitchen monitoring system through webpage with ZigBee based technology as explained in paper.

Ravi.M.et.al.[2015] As per author explain automation using in wireless communication has made the systems more smart and automated communication architecture .In the Technology used The Local Area Network this also sends an alerting SMS to a predefined mobile number. It may also remote system if a parameter crosses the threshold In the proposed system, the patient's physiological conditions are acquired by the wireless sensors nodes attached on the patient body, and are then transmitted to the remote base-station. Base station is designed using a Raspberry Pi. The Raspberry Pi is basically ARM 11 processor with features like serial communication and Ethernet and so on. All features are explored to communicate with the WSN architecture to perfectly acquire data and update the status to doctor's chamber using LAN in resctive order . In the Wireless Sensor Nodes designed using ZigBee is emerging as a significant element of next generation healthcare services. In this paper we proposed a mobile physiological monitoring system, which is able to continuously monitor the patient's heart beat, blood pressure and other critical parameters in the hospital. In entire system consists of a router node to acquire the patient's physiological data with systammic way. The transmitted data from the router node is received by the coordinator node. The coordinator node connected to the server. All the main nodes designed to update the data using LAN. It helps is easy way to monitor the patient at their chamber and helps doctors to take immediate actions on respective condition in particular research domain.

Keerthi VallapReddy.et.al.[2014] In this paper author has proposed a completely automated license plate recognition system with detail diagram. In the aim of research at designing a system which automatically captures the image of the number plate of a vehicle. These details were verified using Raspberry Pi processor for authentication. The system also alerts the authorities when any unauthorized image of number plate was detected using buzzer alarm system. In the explanation when the authorized vehicle was detected then the system operates the gate using DC motor the related work. As automation is the most frequently spelled term in the field of electronics consider with research area .In the require for automation brought many revolutions in the existing technologies area. As per project direction it makes use of an onboard computer, which is commonly termed as Raspberry Pi processor as architecture. In a paper it acts as heart of the project. In the onboard computer can efficiently communicate with the output and input modules which are being used through all paper in research work.

Fabio Leccese et.al.[2014] In paper A smart city application has been realized and tested in well manner. In paper fully remote controlled isle of lamp posts based on new technologies with architecture. As per the new designed and organized in different hierarchical layers system, which perform local activities to physically control the lamp posts and transmit information with another for remote control. Locally, each lamp post uses an electronic card in system for management and a ZigBee network. The new concept network transmits data to a central control unit, which manages the whole isle in research work. The central unit is realized with a Raspberry-Pi control card due to its good computing performance at very low price in system. The Smart City (SC) paradigm helps renovate the traditional city concept. In fact, it is possible to realize and develop efficient demand-side strategies integrating the monitoring and automation features ensured by intelligent devices and their communication apparatuses typically used in many applications. Within this concept, public lighting, being a great electrical energy consumer, has recently been attracting the interest of the research community. Scientists, combining the SC paradigm with alternative energies and new lighting technologies, are conceiving systems previously unimaginable, which can increase the efficiency obtaining considerable energy consumption savings and consequently money savings, a WiMAX connection was tested and used to remotely control the smart grid, thus overcoming the distance limitations of commercial Wi-Fi networks. The isle has been realized and tested for some months in the field.

Oğuz Gora et.al.[2015] In recent years embedded systems have gained more importance. These systems are especially dedicated to specific tasks which are handled by highly optimized solutions. One of the interesting areas of embedded systems use is multi-media. Producing, processing, streaming various multimedia types and interacting with the physical environment is very common today. Similar to these studies, controlling and observing the specified area by multi-media tools are the necessities for many reasons such as security. This

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paper presents a method of video and photo recording of any moving object by using open source operation system (Raspbian- a distribution of Linux) and software (Python – a high-level programming language). The system is triggered by a motion sensor and it collects visual data from a specified area for limited duration. The collected data is published on internet via dedicated web site. The system works by itself but with a web interface many control abilities are possible program in Python operates the camera.

V.Ramanath et.al.[2015] This paper focuses on the use of face recognition technique for Car ignition, as opposed to the natural method of using keys. Face recognition is a fast increasing, interesting area in real time applications. The face recognition methodology enables face recognition of valid users of the vehicle to be enrolled in a database. Before any user can access the car, the image of his face is matched against the faces in the database. The users with no match in the database are prevented from accessing the vehicle. Haar features are used for object detection and Principal Component Analysis is used for face recognition. This work is implemented on Raspberry Pi microcontroller and this is very low cost system. we propose an embedded system that performs the Face Recognition using ARM1176JZF-S (Raspberry Pi) processor. This embedded system using Raspberry Pi has the feature of image or video processing. So, our embedded system that detects the image with high speed.

3 .EXISTING SYSTEM

Here in this they had actualized a framework in which we can screen the distinctive segments in enterprises by getting a ready sign has been happened. In this when fire accidents had happened or is there any gas spillage happened, the sensors will distinguish it and send a ready sign through ringer.

DISADVANTAGES

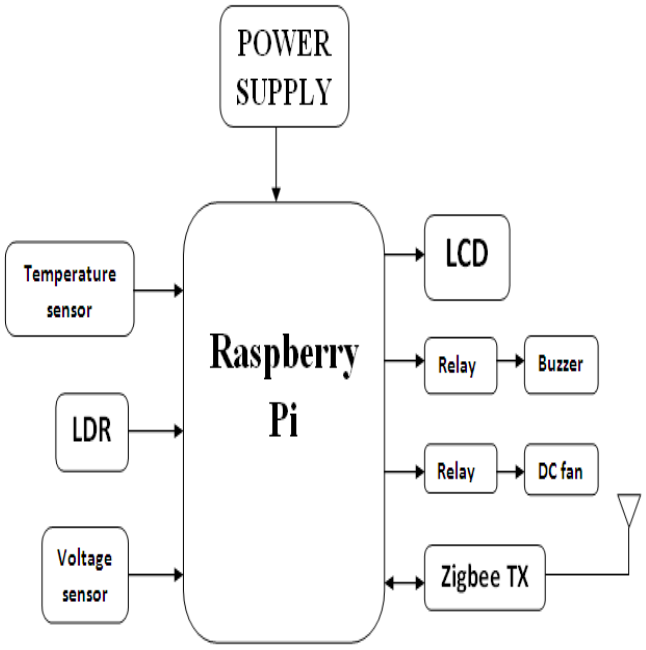
Here we cannot monitor the parameters in industries wirelessly.

4 .PROPOSING SYSTEM

Here we had completed a system which is used to screen overall mechanical technique through remote correspondence in perspective of Raspberry Pi. In this we can screen the parameters like temperature, Light power and change in voltage. We realized this system to vanquish the issues went up against in existing structure. Figure underneath exhibits the utilization of proposed system:

BLOCK DIAGRAM

Transmitter section



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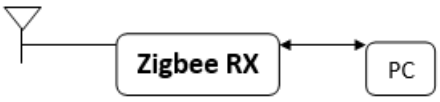
Receiver section



5 . WORKING

Wireless technologies are being more and more used in automation & the field of wireless communications is diverse. The advancement in wireless technology offers a good opportunity in the area of communication. This paper is focused on design & implementing raspberry Pi based Global industrial process monitoring through wireless communication.

For implementing this system we have used sensor modules like Temperature, LDR, and voltage. All these modules are interfaced to Raspberry PI. In this system we used Zigbee technology which is used to monitor the parameters of the industries wirelessly. Here when the temperature value has exceeded then automatically fan will switched ON, if the LDR is activated and voltage sensor value has exceeded then automatically an alert signal will be given by using Buzzer. All the information related to these parameters will be send to the main system by using Zigbee. So, by using Zigbee we can monitor the parameters in the industry wirelessly.

6. CONCLUSION

The goal of this system is to provide a new platform for various types of applications. These systems are today characterized by the distribution of intelligence to devices close to the processes and equipment under control. The application of modern information and communication technologies in industrial automation provides a good basis for the future. Here a low cost secured wireless communication system has been designed by using Zigbee technology. Implementation of Zigbee using Raspberry Pi for an intelligent monitoring is a new method to monitor an environment which is designed here for the real time applications. Compared with other applications, this system has advantages in terms of allowing direct bidirectional communication. The system is designed to support both static and dynamic IPs .In this system our task is to acquire data from sensor and make it by any remote client.

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