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IOT Based Monitoring and Controlling System for Industries

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ABSTRACT

In this paper, the proposed system is the essential need of the industry for monitoring, control, security and safety of different activities. The monitoring system includes sensor i.e. fire sensor, smoke sensor, ultrasonic sensor, humidity & temperature sensor, current & voltage with wifi module for controlling. With the receiver of abnormal activities, suitable actions or alert will be triggered. This system can also be controlled by remote server with application in computer/ Laptop. This project also includes Facial Recognition using open CV to recognize the face of the authorized person of industry for log in and log out and the details will be stored in the database sheet or updated to cloud. If any invalid entry, an alert sms/email will be sent to the respective authorized official person/ team.

Keywords : Facial recognition, Open CV Wifi module, monitoring, database.

I. INTRODUCTION

At present the innovations in technologies are mainly focusing on monitoring & controlling of different activities, by which processes can be implemented without human assistance. In this new era of Smart Industries of Monitoring & controlling of various Industrial applications Internet of Things (IoT) is the most ideal method for interfacing mechanical hardware and sensors, to one another, over the web.

The most commonly used automated systems now a day's are wired system using SCADA and PLC's. For communication, they uses machine to machine protocols. Which at last result in increasing the cost of system, hence such technology is not affordable for small scale and medium scale industries. The propose of this paper, aims to make the simplify this system technology which will help in makeing production and working in industries more comfortable.

This paper gives the solution for low cost system for industries. It comprises of wireless framework using Internet of things like monitoring, control and security. It is trending technology. In which the network will be formed by physical devices embedded with sensors, software, connectivity and actuators which enable devices to communicate and exchange data within the database.

In this project, the system will uses different sensors like smoke, fire, humidity & temperature, current & voltage sensors for monitoring and controlling, security system uses facial recognition to identify employee and register their presence in database. Sensor will get activated with any abnormal activities and by using an alert system, it will also inform automatically to the concerning person regarding restricted areas. Mean while the remote server will also be capable of taking actions on the basis of events that are occurring. It can also be manually controlled.

II. LITERATURE REVIEW

Anand Raut; Janhavi Vaity; Pankaj Yadav & Ramprit Yadav has designed an IOT based system for patient monitoring. In this they used temperature, ECG & heartbeat rate senors to keep track of patient's health where sensors were connected to a microcontroller and wifi module to detects if any abnormal changes in patient it will automatically send alerts the user about the patients status over IOT showing details of patient live. [1]

Dr. S.W Mohod, Rohit S Deshmukh has used in the industrial factory for monitoring and control the activities of industrial processes, motors, machines and devices employed in industry premises to achieve the goal. [2]

Prof. Dr. K. Srinivasa Rao, Bulipe Srinivas Rao, Mr. N. Ome, they proposed a system for advanced solution on monitoring the weather conditions at specific locations and make the information visible online through IOT. [3]

Wai Lee, used the concept of TOF in which the author has given a new class of 3D ToF (Time-of-Flight) image sensors that will improve the vision of the "things" of IoT. [4]

Takayuki Suyama,Yasue Kishino, Futoshi Naya , has designed an environmental monitoring system deployed in greenhouses, a virtual machine called CILIX, which can work on 8/16 bit CPU, 4KB RAM, and 32KB program memory with reasonable compatibility to existing CIL-VM. [5]

Anam Mir, Ajitkumar Khachane, This project is the integrates a Wireless Sensor Network (WSN)-based harmful gases sensing system using different gas sensors and whose sensed data is passed through IOT gateway to server [6]

R.Vidya Raghavendran, J Antony Daniel Rex, R.Jayasri, has given a survey of different papers on industrial automation based on iot with arduino microcontroller. [7]

Jothi S, Chandrasekar A, Jenif D Souza W S, have designed Image Capturing system used for automated attendance marking and management system, Segmentation of group photo and Face Detection, Face comparison and Recognition, Updating of Attendance in database. [8]

Thida Nyein, Aung Nway Oo, the proposed system achieves the great accuracy for multiple face recognition when FaceNet is used as a feature extractor and SVM is used as a classifier. [9]

KEEM SIAH YAP, SHEN YUONG WONG, QINGWEI ZHAI, AND XIAOCHAO LI, in this paper, the authors has distinguished and unified two stages of face verification with end-to-end face verification framework, that well integrates into a unified locally connected ELM architecture, denoted as Hybrid Local Receptive Field based Extreme Learning Machine with Deep ID. [10]

III. PROPOSED SYSTEM

In this paper, the system is based on technology of IOT Monitoring, Controlling and security in the industrial environment. Figure 1 shows the block diagram of security system, developed with the help of Arduino UNO with LCD, Servo motor etc. for the restricted area in industry

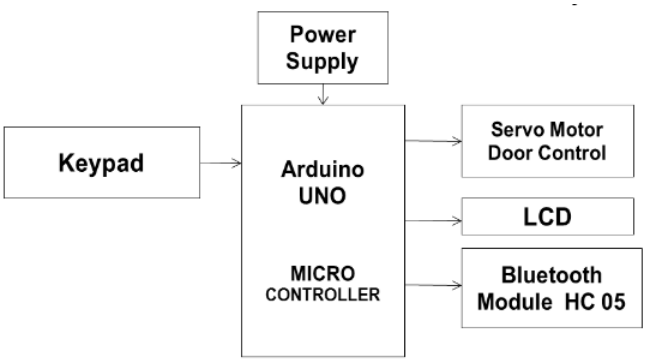

Figure1: Block diagram of security section

like boiler, furnace area to neglect accidents and safety of employers & working staff. Similarly Figure 2 represents the block diagram of facial recognition with log system, an system to recognize face developed using Python/ open CV for the project I am using laptop webcam for face scanning/ recognizing if the face is successfully recognized then it

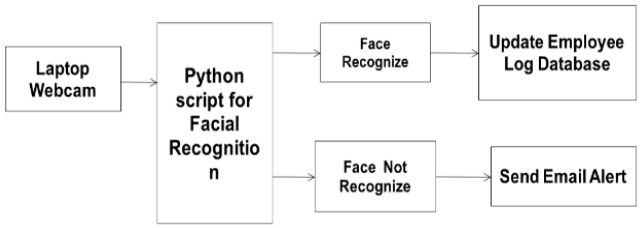

Figure 2 : Block diagram of facial recognition

will update the entry of the employ in the database, if not then an alert mail will be send to authorized person/ team.

Figure3 shows the proposed overall system block diagram of the project including Server, sensors, Wi-Fi modular etc. In this different type of sensors like Smoke, Voltage, Current, Fire etc Sensors are used for industry environment & machinery monitoring & controlling.

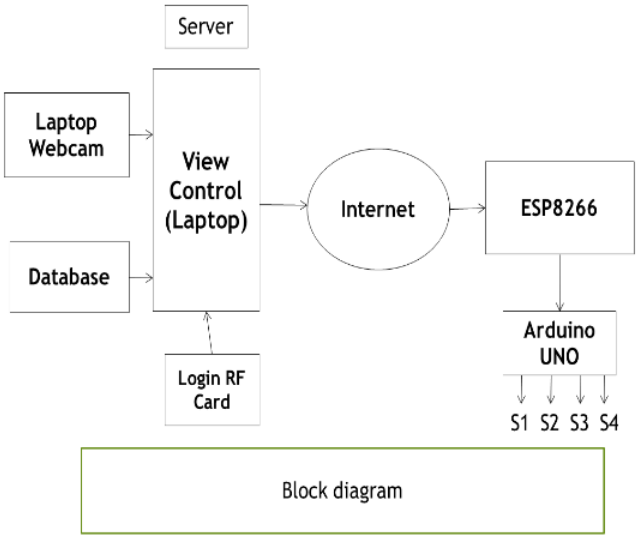

Figure 3 : Block Diagram

IV. CONCLUSION

In this paper we have discussed about comparative and research analysis of various system developed using IOT technology for monitoring and controlling for industry. We have tried to develop a low cost system for smart industries for remote monitoring, controlling and security as per the demand of industry using arduino, open CV system.

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