Embedded IoT based System for Industrial Environment Security

J.Sanjeev[1]

[1]Department of Computer Science, Sri Ramakrishna College of Arts and Science, Coimbatore

A B S T R A C T

Internet of Things (IoT) is an advanced technology in Industrial Sectors. IoT is a combination of networks which include the embedded based physical devices and various sensors. They are used to collect and exchange data among the network connections. This paper deals with Industrial security system with the help of IoT. The IoT is also derived from the combination of popular technologies like RFID and Wireless sensors based systems. A proposed system is used to automatically monitor the industrial applications in real time and generates the alerts and takes intelligent decisions using concept of IoT. An Intrusion detection system along with machine learning approaches has been discussed in this paper to ensure the solutions of Industrial security issues in a correct manner. A main aim of this paper is to summarize the uses of IoT in industrial environment

Keywords: IoT, Sensors, Embedded, Machine Learning approaches.

1. Introduction

 In the recent years, the evolution of embedded based technologies in the Industrial environment has incorporated with IoT applications. The RFID and Wireless sensor based systems [1] are the suitable technologies of Industrial security purposes before the invention of IoT. The Wireless based network applications plays a vital role in Industry, home and personal communication systems automation in a successful manner. The Embedded based industrial automation system requires real-time communication and control systems in the factory. They need to ensure the accurate control and rapid communication in industrial motion control system [2]. In this type of application, the communication system performance and efficiency will be evaluated to ensure it is applicable to the industrial networks.
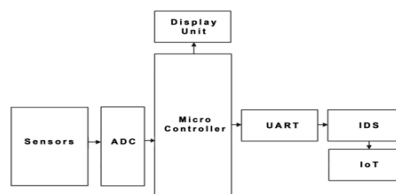

Fig. 1. Block diagram of Proposed System

2. Overview of the Proposed system

        In the advancement of automation in the industrial environment is incorporated with IoT to provide solutions to the security issues, reducing the time and increasing the production. The IoT plays a vital role in the development of Industries [3]. This paper reviews the security issues among the IoT data collections and exchanges. A proposed embedded based system block diagram as shown in the Figure (1). It consists of Smoke sensors, Proximity sensors, Infrared sensors, Piezo sensors, Temperature sensors, Humidity sensors, Intrusion sensors, Vibration sensors, Pressure sensors, Optical sensors and Image sensors. The outputs of these sensors are fed into the Processing Unit through Analog to Digital Converter (ADC). The Microcontroller

acts as a processing unit of this proposed system. The sensors output has been processed and it takes the necessary actions, decisions and alerts in a proper way through IoT. The Intrusion Detection System (IDS) plays a vital role to detect attacks in the network. The modern day automation challenges solved by the IoT along with the next generation sensors. In earlier days the industrial alerts are based on the manual operations. The notifications for any circumstances in industry are not provided in a real time. Time consumption also high due to the manual intervention and there are no proper actions to be carried among the industrial environment. These issues can be overcome by the implementation of IoT in industrial areas [4] [5]. This proposed system can automatically monitor the industrial applications and generate Alerts/Actions and take intelligent Decisions.

3. Conclusion

The automation is an important role in the industrial environment. In the earlier situations the industry could by monitored by CCTV. The Real time alerts or actions are received through these devices. The proposed embedded system network security issues are to be solved by IDS along with the machine learning algorithms. The accuracy of the fault attacks can be recognized by best suitable Brain storm optimization algorithm. This proposed system is used in industry to monitors as well as to inform the responsible person to take appropriate measures through IoT. The aim of this system implementation is used to reduce the time consumption, human intervention and provide the alerts in accurate manner and take the intelligent decisions among the industrial environments.

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