HAZARDOUS AREA MONITORING FOR INDUSTRIAL PLANT POWERED BY IOT

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V S D Rekha published on " International Conference on Electronics and Renewable Systems (ICEARS) 2022".IM Everyday life is undergoing technological developments for a higher standard of living as well as for safety and security. IoT is a wireless communication development. The concept of gas leakage detection with an alert system using the internet of things has been shown in this research. Numerous gases that are dangerous to life are all around us yet may go unnoticed. If there is a gas leak over the places that are important to households, industrial plant personnel, and oil refinery employees, and the gases are flammable, there will be a loss of life. Therefore, this study suggests a configuration that can notify us anytime a gas release occurs. The Arduino Nano is utilised in this essay. Gases like LPG are detected using the MQ-2 Gas Sensor. The Arduino Nano is wired to monitor things like carbon monoxide. The 16x2 LCD panel and GSM module on the Arduino Nano are interfaced. The GSM module calls and sends an alarm SMS to the individual. When a gas leak is discovered, the system quickly provides an alert signal by buzzing, lighting the LED connected to the MCU, and displaying a warning message on the LCD. Gas leaking is signalled by green and red LEDs.

Michael Frey Published on "IEEE 5th World Forum on Internet of Things (WF-IoT) 2019".Sensors are typically used in industrial production plants to monitor or record operations, and actuators are used to enable corrective actions in the event of errors, failures, or harmful situations. Embedded controllers connect these "things" to local networks, which are now made possible by the Internet of Things (IoT). These local networks are frequently wireless low-power networks that connect to a cloud via the global Internet. Under the industrial IoT, interconnected sensors and actuators form a crucial subsystem that typically operates in challenging circumstances. How to interconnect vital industrial components in a secure and safe way is now up for discussion. In this study, we examine ICN's potential to offer limited controllers in industrial safety systems a secure and reliable networking solution. Hazardous gas sensing is demonstrated here. Compare with IP-based techniques like CoAP and MQTT in common industrial settings, such as refineries. Based on our research, information centric networking should be implemented in a safety-critical industrial IoT due to the content-centered security model and improved DoS resistance. Evaluation of the RIOT operating system's crypto efforts for content security reveals their viability in typical deployment settings.

YUCHEN JIANG Published on" IEEE International conference 2018".As the foundation of Industry 4.0, industrial cyber-physical systems (ICPSs) have emerged as a crucial transdisciplinary study topic in both business and academia. The overall safety and stability of the system have begun to face new threats as a result of the expanding size and complexity of systems, inadequate information flow, and the exploitation of existing knowledge. These difficulties, along with the strategic and practical requirements of creating ICPSs for safety-critical systems like the intelligent factory and the smart grid, serve as the driving forces behind this effort. It explores the state of the art in ICPS monitoring and control research and examines new developments in monitoring, fault diagnosis, and control strategies based on data-driven realisation, which can fully exploit the wealth of data available from prior observations. and those that are continuously gathered online. The primary challenges to be addressed for the monitoring and safety control tasks are summarised as the practical requirements in the usual ICPS applications. As a guide for future study, the major problems and the potential research directions are presented.

SUDIP MISRA Published on "IEEE International conference 2022" .The Industrial Internet of Things (IIoT) connects all of the actors who are involved in an industrial environment in order to increase operational and management efficiencies. Data can travel over a communication network that is frequently complicated and heterogeneous thanks to this bridging. It allows for prompt decision-making that has an impact on a variety of organisational areas, including business, operations, maintenance, safety, stock, and logistics. Despite the abundance of works in the IIoT field addressing the aforementioned aspects, very few works address safety in industries. Industrial safety is a crucial area that has room for improvement in the context of IIoT-based solutions for industrial safety management, especially whenever it is linked to human safety. We give a thorough overview of through this examination of of the industrial safety problems that are common. The safety aspects of several IIoT application domains, including healthcare, transportation, manufacturing, and mining, are then categorised and thoroughly examined. Finally, we review the research gaps in several fields and suggest new lines of investigation. To secure people's safety and reduce hazards, we explore a variety of technologies, prototypes, systems, models, methodologies, and applications. This research's main goal is to investigate, synthesise, and acknowledge the applicability of previous studies to safety management using the IIoT.

M. Duraisamy Published on "International Journal of Innovative Research in Science, Engineering and Technology (IJIRSET) 2020".Industrial surroundings are crucial for both machines and people, despite security and automation in facilities. With a safety in industrial condition, this paper is contracted. A method has been created to identify risky circumstances, such as breakdown, which is the primary cause of leakage current in substations, and assist in preventing them. In order to validate the method employed in this method, safety scenes were also constructed. This method is intended to safeguard a person. This method reveals the negative effects of thermally hazardous environments and people. Automation systems that monitor the system and flag any errors reduce the amount of work thatmust be done by humans. The GSM concept is employed in this study. It consists of a network of physical items or things with electronics, software, sensors, , which use this object to gather and exchange data over networks. In this work, a system is designed that uses the GSM idea to generate alerts and alarms, take informed decisions, and automatically monitor industrial parameters including temperature, gas, fire, and humidity. Various characteristics, including temperature, humidity, gas, and fire, will be monitored by an automated system in this industry.

Silvia Liberata Ullo Published on " International journal of innovative Research 2020". Genuine environmental difficulties are caused by a number of important elements, including poor air quality, water pollution, and radiation pollution. A healthy society must be maintained in order for the planet to experience sustained growth. With the development of modern sensors and advancements in the internet of things (IoT), environment monitoring has evolved into a smart environment monitoring (SEM) system in recent years. In light of this, the current work seeks to complete a critical evaluation of significant contributions and research studies on SEM that focus on the monitoring of water quality, air quality, radiation contamination, and agricultural systems. The review is separated into sections based on the uses of SEM techniques, and then each usage is further examined in terms of the sensors employed. utilised classification algorithms and machine learning techniques. The thorough review, which included important suggestions and impacts of SEM research based on discussion outcomes and patterns in the literature examined, is followed by the in-depth analysis. The authors have conducted a thorough analysis of how improvements in sensor technology, IoT, and machine learning techniques have transformed environment monitoring into a fully intelligent monitoring system. Finally, a framework for reliable machine learning techniques, denoising techniques, and the creation of appropriate standards for wireless sensor networks (WSNs) has been proposed

Lei Shu Published on "The 43rd Annual Conference of the IEEE Industrial Electronics Society 2017". Industrial risks like accidents in coal mines, like fires from organic gases and underground water intrusion, toxic gas leaks in large-scale petrochemical industries, and natural disasters like hurricanes, storms destroying high tension voltage line resulting in power fluctuation cause severe damage to industry, environment, and human life. However, several research projects concentrate on the estimation of hazardous area boundary using the existing methodologies using handheld devices with static cable-connected sensor nodes and wireless sensor nodes in Industrial Wireless Sensor Networks (IWSNs). The features of poisonous gases, such as their invisibility, rapid movement, and changing shape, as well as the unexpected onset of industrial dangers, make it more difficult to determine an accurate border. Additionally, if only hazardous areas are reported, the evacuation route cannot be safely designed. for people. In industrial applications, pre- and post-disaster management must also be designed. Providing real-time monitoring and creating fresh, efficient strategies for using IWSNs to quickly identify safe areas when industrial hazards occur in industrial plants are crucial initial steps toward achieving this goal.

Lee Renforth Published on "Petroleum and Chemical Industry Technical Conference (PCIC), Record of Conference Papers Industry Applications Society 59th Annual IEEE 2012" In their work, the authors discuss the use of a novel method for remotely monitoring stator insulation health in high-voltage rotating machines while they are in operation. The method uses high resolution measuring technology and wideband, ferrite-based current transformer sensors. When monitoring motors in Ex hazardous gas zones in oil and gas and petrochemical facilities, this remote partial discharge monitoring system has significant advantages. A technical evaluation of articles that have already been published on the history of the advancement of contemporary, online partial discharge sensors and measurement systems for rotating machines is included in the study. The various partial discharge sensor options are then compared, and the remote wideband partial discharge monitoring measurement is introduced after that. the authors' method of operation. An example case study from a recent pilot project (August 2011) that successfully tested novel remote partial discharge monitoring measuring techniques to gauge partial discharge activity of operating 10 kV motors in an oil processing facility is also provided

R.Hillebrand Published on " Petroleum and Chemical Industry Conference, PCIC '06. Record of Conference Papers - IEEE Industry Applications Society 53rd Annual 2006".Cost-cutting puts manufacturers and end users under increasing strain today. There are various methods to accomplish this. All previous attempts have led to the same fundamental conclusions because safety and dependability must never be compromised. The traditional methods frequently required the employment of expensive machinery or expensive maintenance procedures in dangerous places. Fresh thinking has now produced new answers that, though they initially seem simple, have never been tried previously for some mysterious reason. The next chapters demonstrate how tried-and-true ideas used in a novel setting can result in a significant advancement that makes hazardous area instrumentation almost as simple to design and operate as safe area equipment. The reader will discover how to get beyond the obstacles. both conventional field instrumentation and bus systems can take advantage of intrinsic safety while maintaining its benefits in terms of servicing and maintenance.

Long Zhao Published on "IEEE Transactions on Industry Applications 2019". The Internet of Things (IoT) idea enables things to communicate by sharing data across wired or wireless connections. The term "Industrial Internet of Things" (IIoT) refers to the integration of data collection, transmission, and processing through a real-time network. In several applications, IIoT is currently involved in the creation of smart grids. Low-latency communication needs to be taken into account for the majority of control and monitoring applications since the operation of power systems is particularly time-critical. IoT's real-time capacity is seen as a crucial component for applications that monitor and manage power supplies. As a result, system operators may make better judgments for both technical and financial-related issues by using the real-time monitoring system. This research presents a fast IIoT-based monitoring system is created and put into use for a power system substation with recording capabilities. An FPGA-embedded controller is used in this system because of the high processing speed and dependability of FPGAs. The IoT platform also offers real-time remote visualisation for system administrators. The primary goal of this study is to present a real-world application that was put to use and tested in a power substation. The system uses a single high-resolution time source as the reference for steady-state and transient situations and combines the capabilities of an IoT platform with the requirements of high-speed real-time applications.