# LITERATURE SURVEY FOR IOT BASED HAZARDOUS AREA TEMPERATURE MONITORING SYSTEM FOR INDUSTRIAL PLANT


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## LITERATURE SURVEY

| S.NO | TITLE | AUTHORS | DESCRIPTION |
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| 1. | Design and Implementation of Real-Time Mobile-based Water Temperature Monitoring System | PaulBb.Bbokingto Jr,<br>Orven E.Lllantos. | The objective of this research is to design and develop a real-time mobile-based water temperature monitoring system capable of decreasing the reliance on manpower at the monitoring site to reduce the cost and to assess fish production cycle and fish grow-out system. The system implementation resulted in a monitoring system that collects the current water temperature from the core-controller in real-time. Also, the system provides and displays information that includes normal range, maximum, minimum, average and findings of the collected temperatures. The results |

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| | | | obtained in this study has shown the ability of data acquisition in the remote and real-time detection of water temperature accurately and efficiently. It provides decision support to help and guide fisher folks in avoiding distress to fish and obtaining the optimum water temperature range. |
| 2. | Design of an Industrial IOT based Monitoring System for power substations | Long zhoa,<br>Igor matsuo,<br>Wei-jen lee ,<br>Yuhao zhou. | 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 |

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| | | | 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. |
| 3. | Security for the Industrial IoT: The Case for Information-Centric Networking | Michael frey, Martine s. lenders, Peter kietzmann. | 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 |

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| | | | and improved DoS resistance. Evaluation of the RIOT operating system's crypto efforts for content security reveals their viability in typical deployment settings. |
| 4. | Data-Driven Monitoring and Safety Control of Industrial Cyber-Physical Systems: Basics and Beyond | Yuchen jiang, Shen yin, Okyay kayanak. | 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 |
| 5. | Industrial Internet of Things for Safety Management Applications: A Survey | Sudip misra, Chandana roy, Thilo sauter. | 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, |

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| | | | 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. |
| 6. | Two compact robots for remote inspection of hazardous areas in nuclear power plants | J. Savall,<br>A. Avello,<br>L. Briones | Two mobile robots for the inspection of radioactive areas in nuclear power plants are described. Robicen III is a compact pneumatic robot of 3 kg designed for the inspection of radioactive cylindrical tanks. With a novel locomotive mechanism based on pneumatic actuators and suction pads, it is able to climb vertical walls at speeds close to 110 mm/s. MonoCaRob is a |

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| | | | rail-guided autonomous robot for inspection in the drywell of BWR power plants. Copper rails and brushes provide a rugged and robust means for power supply and communications. A video camera and a variety of sensors can be carried by the robot during drywell inspections |
| 7. | Applications of Wireless Sensor Networks in the Oil, Gas and Resources Industries | Mohammad reza akhondi,<br>Alex talevski,<br>Simon carlsen. | The work focuses on networks that monitor the production process, to either prevent or detect health and safety issues or to enhance production. WSN applications offer great opportunities for production optimization where the use of wired counterparts may prove to be prohibitive. They can be used to remotely monitor pipelines, natural gas leaks, corrosion, $H_2S$, equipment condition, and real-time reservoir status. Data gathered by such devices enables new insights into plant operation and innovative solutions that aids the oil, gas and resources industries in improving platform safety, optimizing operations, preventing problems, tolerating errors, and reducing operating costs. In this paper, we survey a number of WSN applications in oil, gas and resources industry operations. |
| 8. | Wireless goes process automation - challenges in hazardous areas | Stephan schultz | Wireless is predicted to be one of the fastest growing technologies in the area of automation technology in the upcoming years. It is obvious that the ongoing trend towards wireless transmission of data like e.g. WLAN, Bluetooth, ZigBee is entering the hazardous areas of the chemical, petro-chemical or pharmaceutical industry too. There is unfortunately not the one and |

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| | | | only technology covering all needs. The applied wireless solution need to be selected carefully based on the demands of the application. Beside all mentioned challenges in the field of wireless functions what are the specifics when wireless enters the hazardous area? Could a wireless signal become an ignition source? What are the limits for the radiated power? How could wireless technology be implemented in the hazardous area? What is the best and most effective way to install it? The presentation discusses these questions and will explain solutions with the advantages and disadvantages. The Pros and Cons of available and future explosion protection techniques will be discussed with the necessary background information and standards. |
| 9. | A reliable Internet of Things based architecture for oil and gas industry | Wazir zada khan, Mohammed yaalsalem, Muhammad khurram khan. | Anomaly detection systems deployed for monitoring in oil and gas industries are mostly WSN based systems or SCADA systems which all suffer from noteworthy limitations. WSN based systems are not homogenous or incompatible systems. They lack coordinated communication and transparency among regions and processes. On the other hand, SCADA systems are expensive, inflexible, not scalable, and provide data with long delay. In this paper, a novel IoT based architecture is proposed for Oil and gas industries to make data collection from connected objects as simple, secure, robust, reliable and quick. Moreover, it is suggested that how this architecture can be applied to any of the three categories of |

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| | | | operations, upstream, midstream and downstream. This can be achieved by deploying a set of IoT based smart objects (devices) and cloud based technologies in order to reduce complex configurations and device programming. Our proposed IoT architecture supports the functional and business requirements of upstream, midstream and downstream oil and gas value chain of geologists, drilling contractors, operators, and other oil field services. Using our proposed IoT architecture, inefficiencies and problems can be picked and sorted out sooner ultimately saving time and money and increasing business productivity. |
| 10. | Self-powered wireless sensor nodes for monitoring radioactivity in contaminated areas using unmanned aerial vehicles | Andres gomez, Marie francicne lagadec, Michele magno. | A self-sustainable wireless sensor node for the monitoring radiation in contaminated and poorly accessible areas is presented. The node is designed to work in collaboration with an unmanned aerial vehicle used for two essential mission steps: air-deploying the wireless sensor nodes at suitable locations and acquiring data logs via ultra-low power, short-range radio communication in fly-by mode, after a wake-up routine. The system allows for the use of off-the-shelf components for defining mission, drop-zone and trajectory, for compressing data, and for communication management. The node is equipped with a low-power nuclear radiation sensor and it was designed and implemented with self-sustainability in mind as it will be deployed in hazardous, inaccessible areas. To this end, the proposed node uses a combination |

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| | | | of complementary techniques: a low-power microcontroller with non-volatile memory, energy harvesting, adaptive power management and duty cycling, and a nano-watt wake-up radio. Experimental results show the power consumption efficiency of the solution, which achieves 70uW in sleep mode and 500uW in active mode. Finally, simulations based on actual field measurements confirm the solution's self-sustainability and illustrate the impact of different sampling rates and that of the wake-up radio |