IOT BASED LOGISTICS MONITORING AND ACCIDENTS AVOIDING SYSTEM

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ABSTRACT: Observing activities of working vehicles on a work site, such as a factory, is important in regard to managing the lifetime of vehicles and achieving high operational availability. However, it is a problem that an administrator cannot completely grasp the activities of a working vehicle. Existing systems cannot cover a large area, particularly in an indoor environment. A system is proposed for monitoring operating activities of working vehicles, regardless of whether they are operating indoors or outdoors. The system calculates theactivity rate of a vehicle by analyzing the topology of a network configured by the wireless technology ZigBee. In addition, it was experimentally verified that network topology and RSSI can be used to estimate activities of working vehicles. Further, this concept is enhanced by using wireless sensor network and IOT platform .

KEYWORDS: activities of working vehicles, factory, Internet of Things (IOT), Zigbee, Arduinouno, GPS, GSM

INTRODUCTION:

Today sensors are everywhere. We take it for granted, but there are sensors in our vehicles, in our smart phones, in factories controlling CO2 emissions, and even in the ground monitoring soil conditions in vineyards. While it seems that sensors have been around for a while, research on wireless sensor networks (WSNs) started back in the 1980s, and it is only since 2001 that WSNs generated an increased interest from industrial and research perspectives. This is due to the availability of inexpensive, low powered miniature components like processors, radios and sensors that were often integrated on a single chip (system on a chip (SoC)). The idea of internet of things (IoT) was developed in parallel to WSNs. The term internet of things was devised by Kevin Ashton in 1999 [1] and refers to uniquely identifi able objects and their virtual representations in an "internet-like" structure. These objects can be anything from large buildings, industrial plants, planes, cars, machines, any kind of goods, specifi c parts of a larger system to human beings, animals and plants and even specifi c body parts of them. While IoT does not assume a specifi c communication technology, wireless communication technologies will play a major role, and in particular, WSNs will proliferate many applications and many industries. The small, rugged, inexpensive and low powered WSN sensors will bring the IoT to even the smallest objects installed in any kind of environment, at reasonable costs. Integration of these objects into IoT will be a major evolution of WSNs. A WSN can generally be described as a network of nodes that cooperatively sense and may control the environment, enabling interaction between persons or computers and the surrounding environment [2]. In fact, the activity of sensing, processing, and communication with a limited amount of energy, ignites a cross-layer design approach typically requiring the joint consideration of distributed signal/data processing, medium access control, and communication protocols [3]. Through synthesizing existing WSN applications as part of the infrastructure system, potential new applications can be identifi ed and developed to meet future technology and market trends. For instance WSN technology applications for smart grid, smart water, intelligent transportation systems, and smart home generate huge amounts of data, and this data can serve many purposes. Additionally, as the modern world shifts to this new age of WSNs in the IoT, there will be a number of legal implications that will have to be clarifi ed over time. One of the most pressing issues is the ownership and use of the data that is collected, consolidated, correlated and mined for additional value. Data brokers will have a fl ourishing business as the pooling of information from various sources will lead to new and unknown business opportunities and potential legal liabilities. The recent US National Security Administration scandal and other indignities have shown that there is wide interest in gathering data for varied uses.

IOT ON IVWSNS:

The IoT can accommodate various nodes to be sensed and controlled remotely within the existing communication infrastructure. It makes an integration of a computer based system directly with the physical world. As a result, the efficiency, accuracy, the complexity of maintenance, and economic benefit of the system improve significantly. Moreover, nowadays, modern vehicles are equipped with various types of sensors for improving driver safety, convenient transportation and traffic monitoring systems. Consequently, the numbers of sensor nodes inside vehicle are increasing day by day. The existing wired Electronic Control Unit (ECU) device and subsystem integrated with Controller Area Network (CAN) has some problems due to the limiting range of sensor installation, and the network complexity. With the increase of sensors inside a vehicle, more wire connections are required for implementation. As a result, the weight, complexity and manufacturing cost significantly increase. Due to these reasons, the IntraVehicle Wireless Sensor Networks (IVWSNs) have recently been introduced to minimise the above complexity in the automotive industries [10, 13]. With the help of wireless technologies inside a vehicle, the weight, cost and fuel consumption of the vehicle can be reduced and a better performance can be achieved. Therefore, a large number of nodes need to be integrated with each other for reliable and efficient communications.

SENSOR NODES:

The sensor node is one of the main parts of a WSN. The hardware of a sensor node generally includes four parts: the power and power management module, a sensor, a microcontroller, and a wireless transceiver, see Figure 3-3. The power module offers the reliable power needed for the system. The sensor is the bond of a WSN node which can obtain the environmental and equipment status. A sensor is in charge of collecting and transforming the signals, such as light, vibration and chemical signals, into electrical signals and then transferring them to the microcontroller. The microcontroller receives the data from the sensor and processes the data accordingly. The Wireless Transceiver (RF module) then transfers the data, so that the physical realization of communication can be achieved. It is important that the design of the all parts of a WSN node consider the WSN node features of tiny size and limited power.

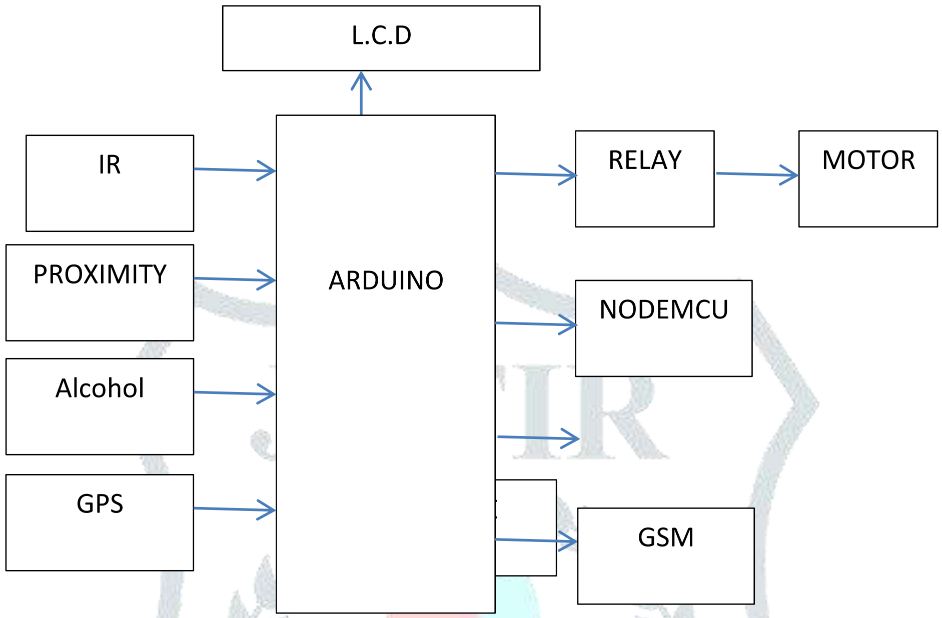


Fig: Proposed block diagram

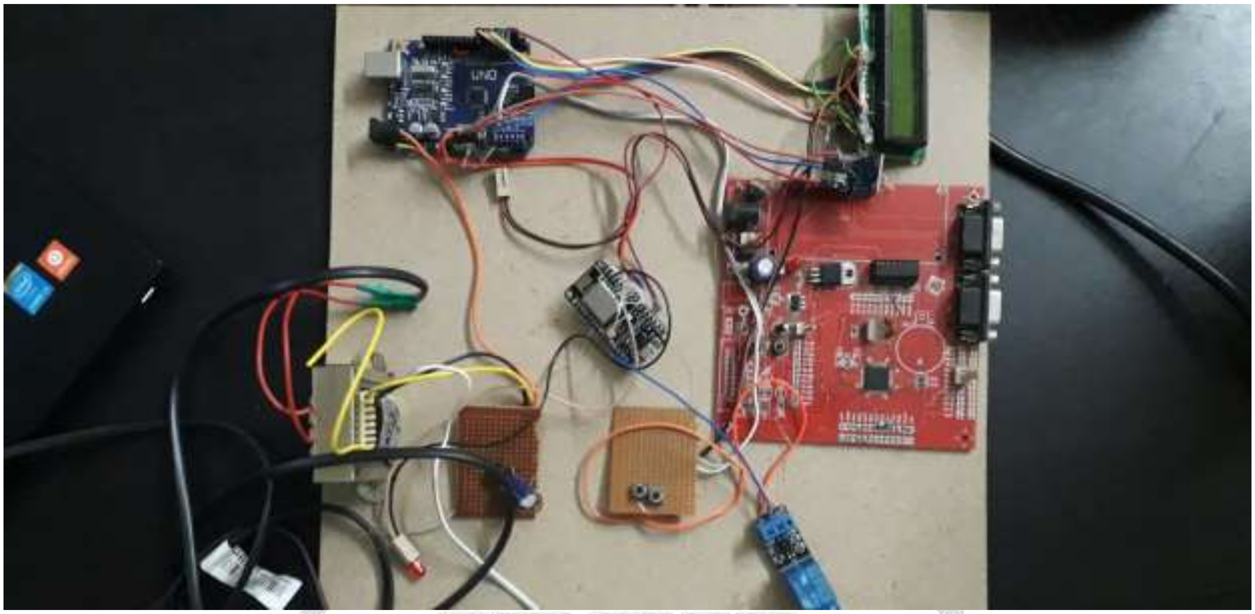
LOGISTIC VEHICLE MONITORING SYSTEM IN APPLICATION:

This paper focuses on three aspects of the WSN-based logistic vehicle monitoring system to improve the monitoring: coverage efficiency, mobility management, and QoS routing. The contents of this paper mainly concentrate on the information collection and data transmission of vehicle monitoring system. 1. Coverage efficiency. Mainly refers to study how to minimize the energy consumption and maximize the function efficiency in the condition which ensures the effective coverage with WSN nodes for vehicle and cargo in the logistics compartment. The overlay management is to study the coverage efficiency of wireless sensor nodes inside the logistics vehicle. 2. Mobile management. Mainly refers to study how to realize the stability of communication quality and reduce communication delay with WSN nodes inside the logistics vehicle when the logistics vehicle moves. 3. QoS routing. Mainly refers to study how to improve the transmission efficiency between the sensor nodes by making full use of communication bandwidth inside the logistics compartment. At present, WSN technology has been put into practice by more and more logistics companies to use improving production efficiency and control of logistics processes. From the operation status of the production enterprises and logistics business, storage environment monitoring, inbound merchandise tracking, dangerous merchandise monitoring, these three aspects are three of the most common subdivision areas of WSN logistics production. WSN with its own unique advantages will have a more wide-spread application with a further study, and the wireless sensor network technology has the main contribution to smart logistics in the collection and receiving process of the information.

EXPERIMENT AND EVALUATION OF PROPOSED SYSTEM:

The performance of the proposed ZigBee network system experimentally measured during tests performed from September 14 to 18, 2015. It was measured with respect to five “automatic guided vehicles” (AGVs) with the help of a construction company in Niigata prefecture Japan. ZigBee devices using XBee were installed in each AGV. The appearance of the system installed on an AGV (and driven by a mobile battery) is shown in Figure 9. Topology and RSSI data were acquired every 5 minutes from 7:30 to18:30. Therefore, an activity pattern having 132 cells was created for eachAGV. To reveal the relationship between hop counts and response time, ZigBee devices were experimentally evaluated. In this experiment, four ZigBee devices wereconfigured in a linear topology by placing them at 30-m intervals within the communication limit for an indoor environment. The device located at the end of liner topology sends packets to the other devices, and the response time was measured.

RESULT:



CONCLUSION:

Logistics monitoring system is a high-tech system which integrates WSN technology, positioning technology and wireless data communication technology. The experiment researches and practices the application technology and wireless access theory of the logistics terminal monitoring experimental system, and draws the following conclusions. First, taking GPRS as the communication link carrier monitoring terminal system, the mobile terminal will be able to enjoy the full access to the Internet function. Second, the results of the moving beacon are simulated and the SCAN and RWP two kinds of motion models are compared. This algorithm reduces quantity of information in transmission and computation information, thus reducing the network energy consumption for WSN technology. Third, short message system overcomes the disadvantages of law transmission speed and improves the reliability of the whole system. Combined with SCAN technology and RWP technology, it has enriched the flexibility and operability of logistics and transportation monitoring. The design scheme based on WSN technology not only realizes the positioning of the delivery tools, but also manages the goods loaded effectively, and achieves the purpose of timely detection of errors and timely processing.

REFERENCES:

[1] Routledge, The Internet of Things: From RFID to the NextGeneration Pervasive Networked Systems (Hardback) - Routledge, (2008).

[2] M. Weiser, R. Gold, The origins of ubiquitous computing research at PARC in the late 1980s, IBM Systems Journal. (1999).

[3] Y. Rogers, Moving on from weiser‘s vision of calm computing: Engaging ubicomp experiences, UbiComp 2006: Ubiquitous Computing. (2006).

[4] R. Caceres, A. Friday, Ubicomp Systems at 20: Progress, Opportunities, and Challenges, IEEE Pervas Comput. 11 (2012) 14– 21.

[5] I.F. Akyildiz, W. Su, Y. Sankarasubramaniam, E. Cayirci, Wireless Sensor Networks: A Survey, Comput Netw. 38 (2002) 393–422.

[6] R. Buyya, C.S. Yeo, S. Venugopal, J. Broberg, I. Brandic, Cloud computing and emerging IT platforms: Vision, hype, and reality for delivering computing as the 5th utility, Future Gener Comp Sy. 25 (2009) 599–616.

[7] L. Atzori, A. Iera, G. Morabito, The Internet of Things: A survey, Comput Netw. 54 (2010) 2787–2805. [8] H. Sundmaeker, P. Guillemin, P. Friess, S. Woelfflé, Vision and challenges for realising the Internet of Things, CERP-IoT – Cluster of European Research Projects on the Internet of Things, 2010.

[9] J. Belissent, Getting Clever About Smart Cities: New Opportunities Require New BusinessModels, Forrester Research, 2010.

[10] Gartner‘s Hype Cycle Special Report for 2011, Gartner Inc. http://www.gartner.com/technology/research/hype-cycles/ (2012).

[11] Google Trends, Google. http://www.google.com/trends (n.d.).

[12] S. Tilak, N. Abu-Ghazaleh, W. Heinzelman, A taxonomy of wireless micro-sensor network models, Acm Mobile Computing and Communications Review. 6 (2002) 28–36.

[13] M. Tory, T. Moller, Rethinking Visualization: A High-Level Taxonomy, Information Visualization, 2004. INFOVIS 2004. IEEE Symposium on. (2004) 151–158.

[14] E. Welbourne, L. Battle, G. Cole, K. Gould, K. Rector, S. Raymer, et al., Building the Internet of Things Using RFID The RFID Ecosystem Experience, IEEE Internet Comput. 13 (2009) 48–55.

[15] A. Juels, RFID security and privacy: A research survey, IEEE J Sel Area Comm. 24 (2006) 381–394.

[16] A. Ghosh, S.K. Das, Coverage and connectivity issues in wireless sensor networks: A survey, Pervasive and Mobile Computing. 4 (2008) 303–334.

[17] H. Alemdar, C. Ersoy, Wireless sensor networks for healthcare: A survey, Comput Netw. 54 (2010) 2688–2710.

[18] T. Kobialka, R. Buyya, P. Deng, L. Kulik, M. Palaniswami, Sensor Web: Integration of Sensor Networks with Web and Cyber Infrastructure, in: H. Jin, W. Jiang (Eds.), Handbook of Research on Developments and Trends in Wireless Sensor Networks:From Principle to Practice, 1st ed, Information Science Reference, New York, 2010: pp. 447–473.

[19] Y. Sang, H. Shen, Y. Inoguchi, Y. Tan, N. Xiong, Secure Data Aggregation in Wireless Sensor Networks: A Survey, in: 2006: pp. 315–320.
[20] M. Zorzi, A. Gluhak, S. Lange, A. Bassi, From Today‘s Intranet of Things to a Future Internet of Things: A Wireless- and MobilityRelated View, IEEE Wirel Commun. 17 (2010) 43–51.
[21] N. Honle, U.P. Kappeler, D. Nicklas, T. Schwarz, M. Grossmann, Benefits of Integrating Meta Data into a Context Model, in: 2005: pp. 25–29.
[22] A. Gluhak, S. Krco, M. Nati, D. Pfisterer, N. Mitton, T. Razafindralambo, A Survey on Facilities for Experimental Internet of Things Research, IEEE Commun Mag. 49 (2011) 58–67.
[23] L. Haiyan, C. Song, W. Dalei, N. Stergiou, S. Ka-Chun, A remote markerless human gait tracking for e-healthcare based on contentaware wireless multimedia communications, IEEE Wirel Commun. 17 (2010) 44–50.
[24] G. Nussbaum, People with disabilities: assistive homes and environments, Computers Helping People with Special Needs. (2006).
[25] A. Alkar, U. Buhur, An Internet based wireless home automation system for multifunctional devices, IEEE T Consum Electr. 51 (2005) 1169–1174.
[26] M. Darianian, M.P. Michael, Smart Home Mobile RFID-based Internet-Of-Things Systems and Services, 2008 International Conference on Advanced Computer Theory and Engineering. (2008) 116–120.
[27] H.S. Ning, Z.O. Wang, Future Internet of Things Architecture: Like Mankind Neural System or Social Organization Framework? IEEE Commun Lett. 15 (2011) 461–463.

BIBLIOGRAPHY:

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