International Journal of Research in Engineering, Science and Management
Volume-3, Issue-3, March-2020
www.ijresm.com | ISSN (Online): 2581-5792

Sensor in a Worthy Use for Higher Security Purposes Operational at Minimum and Maximum Variable Temperature Work for High Fidelity and Increased Performance

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Abstract*: Sensors are used to work on sense and perform on the required work basis. This new generation sensor will be a big boost in the field of sensors family. This newly designed sensor will enhance the work performance and will be operational at variable maximum and minimum temperature for higher fidelity in operation of sensing work. Since there are many sensors present in the market it will simply provide an edge over use of more sensors in a simple circuit for various security purpose uses. The signal to noise ratio(snr) will be very less as compared to other sensors nearly 0.001-0.01 This will boost the working outcome and unnecessary noise present in the sensor. This sensor will be usable in any geographical area either it is hilly or terrain, severe cold or hot weather condition, inland or in water the higher performance can be fully satisfied and required work can be easily accomplished. The main priority of this sensor will be to provide hassle free performance in security area which is been becoming a core area in terms of every field. It can be widely used for all necessarily appliance used for security purposes with increased life duration and higher fidelity in operation. It will work on fifo basis during transmission and receiving of message/data for implementation of any task. The interrupt will be removed based on priority basis such that it can work in any circumstances and provide the maximum output through it. The assignment will be completed in very much limited period of time or in very less time with very fast transmission and point to point interactions to achieve the desired result. The fast and smooth work with very high performance will make this sensor different from other. The use of gallium nitride which is called as future silicon and which is having very higher resistivity at very high maximum and very low minimum temperature which will maintain its work performance in each and every temperature at every circumstances and operational area of higher work performance and will avoid the mid-way break down. Finally, it will be having an advantage of fast working and interaction, implementations, fifo based work, and most accurate result fetching within very less duration of time.

***Keywords*: Fidelity, Security, Terrain, Moisture, Transmission, Accomplished, Performance.**

1. Introduction

Sensor is a device which converts non-electrical, physical or chemical quantity into an electrical signal. Sensors measure something which is called as Measurand. Sensors are also called as Transducers. In other words, sensors convert a measurand into an electrical signal. In the most usual cases, sensors transform some property of the real world, such as temperature, mass, speed, pressure, etc to some electrical signal that we can measure. The signal becomes a representation of the property. Commonly, a voltage represents the value of the measured property. For instance, a temperature sensor might produce an output that is in the range 0Volt DC to 10Volts DC. The voltage will vary directly and in proportion to the temperature measured by sensor. So 0 VDC might represent -50 degrees, and 10VDC might represent +50 degrees. All of the temperatures in between can be determined by measuring the voltage and applying the correct scaling factor. In modern systems, most commonly the voltage is digitized to convert it from the continuous analog realm to a digital form where we can perform arithmetic on it, transmit it, save it, etc. This, however is not part of the sensor, although the two parts may be tightly integrated, as in a 'digital thermometer'.

The nature of the parameter being measured will dictate the makeup of the sensor. Usually, there are constraints that dictate things like maximum and minimum ranges of measurement. The type of sensor will then impart certain behaviors and other characteristics to the measurement. A common way of measuring temperatures in some settings is with a device called a thermocouple. These are based on a property of metals that makes them create a voltage that is a representative of the difference in temperature between two parts of the metal. When the metal is a wire, you can measure the voltages between the two ends. These are great for high temperature measurements where you want to detect temperature changes in the hundreds of degrees. At low temperatures, the voltages are too small to

measure accurately, so other methods are chosen for those. Things like thermistors have temperature dependent resistances, where the resistance changes can be reliably measured at 'human' temperatures. Two different applications, different principles of operation, and different ranges of measurement.

Some sensors might use a combination of material properties to transform the measured property into something electrically useful. For instance, a barometric pressure sensor might rely on a sealed bellows to change shape under the influence of barometric pressure changes. To make that measurable, we apply strain gauges to the bellows, and use their property of changing electrical resistance when stretched or compressed to make the transformation of bellows distortion into an electrical signal that we can measure.

The types of devices and measurement principles used is wildly diverse. It is a field, rich with possibilities, as engineering, science, industry and mankind in general seeks to learn more about the world and the properties that influence our existence. Brilliant minds are daily finding new ways to sense things we probably don't even think about.

2. Related work

There are many sensors in the market which performs the many task as specified earlier. It will be a huge boost in the field of sensor field. It will provide an edge over many sensors present in the market, since there are many sensors used in a simple circuit it will simply provide an advantage over using many sensors to use only a single sensor and perform many task. As there are many sensors which perform the same task but in it the increase in efficiency, durability, performance, stability will be very highly present for the desired outcome snr, attenuation etc. will be very less to maintain accuracy and precision in a systematic way. As Arduino sensors are already present which are having many variation of sensors for different task. It only increases circuit complications and strength and performance is also very low as desired also stability is also very weak when exposed to severe temperature because it uses silicon as the base material. Here gallium nitride will be used whose stability and working and performance is quite very high as compared to silicon based sensors. The coatings of DEA and DSC over sensor will make it perform in any severe condition. It is a non-sticking type of chemical which will be used for coating over to simply maintain its temperature in all-weather condition for maximum and minimum temperature and avoidance of performance degradation. It will be a huge boost as far as security is concerned due to its high performance and maintenance of first in first out (fifo) message implementation and transmission of data over large area either it is hilly, terrain, or water area of work.

3. Sensor System

The world of sensors has made many difficult task to perform in very easy way. It has provided a huge platform in the field of security and surveillance system. As per topology is needed it plays a huge role in defining a system, likewise for environment monitoring, earthquake, climate, building, intruder etc. it provides nearly exact result as the user is needed.

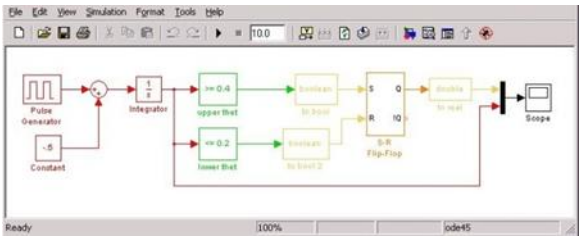

Fig. 1. Pulse generation using SR flip flop

In example as in increasing day today life a huge traffic can be seen on the road where accumulation of vehicles severely increases during the peak time. Where many people get delayed due to traffic. It will interact point to point and will send the data to the task manager, hence as either area which has large no of vehicles will be given green signal to go by communicating and adjusting with microcontroller and 555 timers to avoid heavy traffic in an area with the higher no. of vehicles. Also there are many times it is been seen of traffic signal failure during rainy season. Hence it will strength the signal and will maintain the proper work and there will be no effect in signaling because of dea and dsc coating on sensor and presence of gallium nitride as the main wafer which will increase the lifetime of working and performance in monitoring and final outcome.

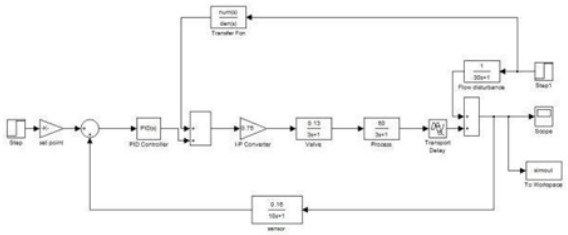

Fig. 2. Simulating model with feed forward

4. Working

As the system will work with point to point interactions with each other and sending the final result to the task manager where previous data and present data will be matched to maintain the linearity in the system. As the system will work on fifo basis it will send the result very fast by the mode of asynchronization method. Which will make it work very fast either in terrain or hilly or water area avoiding the moisture effect by coating.

The full duplex mode will make it to interact with each other similarly performing the task in a desired time and fetching the result from source to destination for further monitoring purposes. The task manger will store the information and will match the result and any difference will be notified and will implement the work as it should have done.

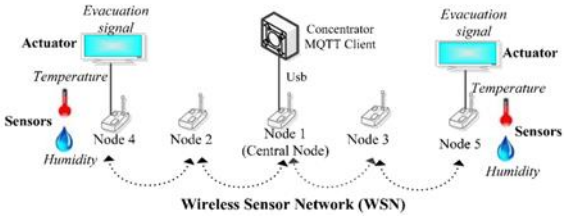

Fig. 3. Integration of sensors and actuators

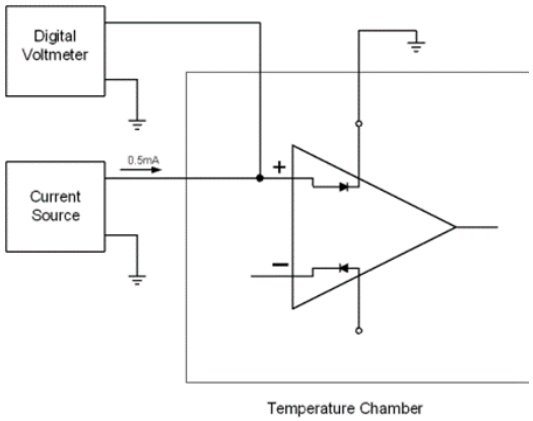

Fig. 4. Graph of sensor at different temperature depends on supply current and at various variable temperature in temperature chamber

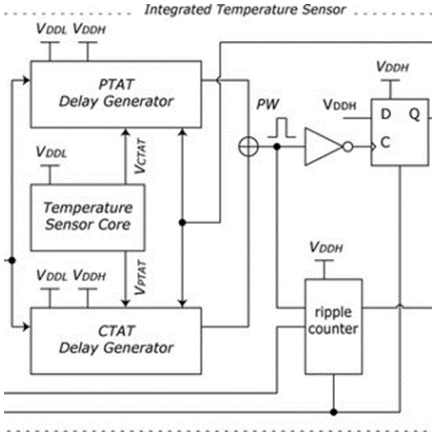

Fig. 5. Temperature sensor with interfacing in the RFID

5. Proposed Algorithm

In PRRP, each round of processing time consists of four phases: gateway selection (GS), tree building (TB), schedule building (SB), and transmission of data (TD). Processing rounds will continue till the routing tree is broken due to the energy level of the gateway dropping below the threshold level.

In the first phase, GS process is completed on the basis of its position, its residual energy level, and the number of neighboring nodes around it. This gateway will be responsible for transferring the aggregated/collected data from the neighboring nodes to the sink. This phase starts with the message initiated from the sink with energy threshold level of.

In the second phase (TB), a routing tree rooted at the sink is built. The newly formed tree will be based on two types of the sensor node such as nonleaf nodes and leaf nodes. Leaf nodes transmits sensed data from the monitored area to its aren't node. The nonleaf nodes act as the intermediate nodes to transmit data from lower to uer level of the tree. Based on this tree, a Time Division Multiple Access (TDMA) schedule subsequently is built in hase-3 (SB) in a distributed manner. In the final phase (TD), the data are transmitted from nodes to the sink based on the schedule reared in hase-3, that is, the distributed TDMA scheduling.

The time required to forward all data packets in a single round is denoted as one data transmission period. That is, a data transmission period may consist of multiple TDs. The TDs may be repeated numerous times in a single round, depending on the energy level of the gateways as illustrated in Figure 2. For instance, in the second round, it has more TDs than in the 1st round. On another note, the number of data transmission periods in a single round shall depend on the application and the periodic events of the sensor network data collection. The RR process flow is depicted in Figure 3. Always in case of tree rebuilt, different sensor nodes will take art in that process, which will become source of equal energy distribution in the network. The energy consumption for overall network will be distributed fairly among all nodes. The following sections describe all the phases.

Gateway Selection: In the first phase a few nodes will be selected as gateways in such a manner as to minimize overall energy consumption in the WSN. The network is assumed to be divided into different grid cells and the cells are further divided into a number of tiers, say, on both sides of the sink. Initially the nodes in tier will be considered as the potential gateway candidates based on their energy level, the distance from the sink, and the number of neighboring nodes. Some of these nodes are allowed to advertise themselves as gateways. However, priority will be based on the residual energy in a node. A potential gateway will act as a gateway until its residual energy drops below a threshold value. Following this, new gateways will be selected from the nodes of tier. Again, the new selected nodes will act as gateways until their residual energy drop below, and so on. When all tiers are considered and no more nodes can be selected as gateways based on the current, a new round will start with a new lower. This mechanism will continue until the last tier and with the second cycle the same process will be continued. However, in this time by the sink will be little reduced by factor. The same mechanism will be continued for all tiers and all cycles until the end. The sink and sensor nodes will exchange messages using the CSMA mechanism. The node will remain ON until it receives the ADV message from the sink and then it sends the JOIN message. Since the node does not need a confirmation from the sink, it will go to sleep immediately after sending the JOIN messages. The gateway selection is based on three different types of parameters such as energy level, number of neighbor nodes and position from the sink. After selecting the gateways, the next phase will start to build the tree. The gateway nodes will initiate the process of building the tree.

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6. System Specification

The system will be designed to work in every weather condition either it is very humid or having more moisture due to rain or fog. The work performance will not be deteriorated in any circumstance. Each and every data will be send in the task manager by node to node communication and will be cloud computed, will be stored for further and future implementation to maintain accuracy and precision in a running circuit. By DEA and DSC coating it will increase the circuit's sensor lifetime.

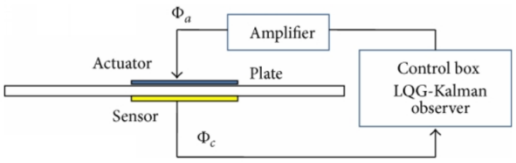

Fig. 6. Closed loop of the sensor controller actuator in simulation

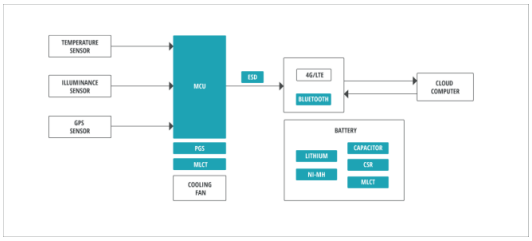

Fig. 7. Automatic smart sensor system

This will enhance performance and will provide variety in operation due to presence of past & present result the circuit complication can be simply reduced by node to node interaction made by sensors to perform a task.

7. Results

The significance can be easily seen as the lifetime of the sensor will increase and high performance can be observed. The circuit will operate in systematic way to perform the task and fetch the result from source to destination without any rupture in the data. Also it will remove heating effects on sensors due to which a sensor breakdown it will increase durability and Y performance in operation and minimizing the circuit complications I use of many sensors to use a single sensor in a circuit. As the noise ratio will be very low i.e. snr ~0.001-0.01 thereby the chance of attenuation & distortion will become very negligible & high performance can be seen.

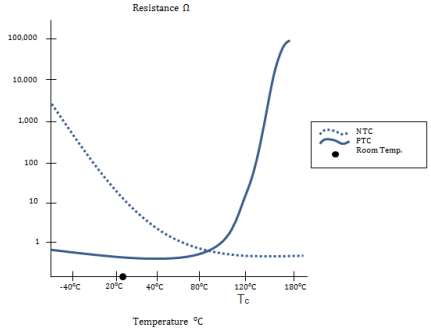

Fig. 8. Resistive temperature graph

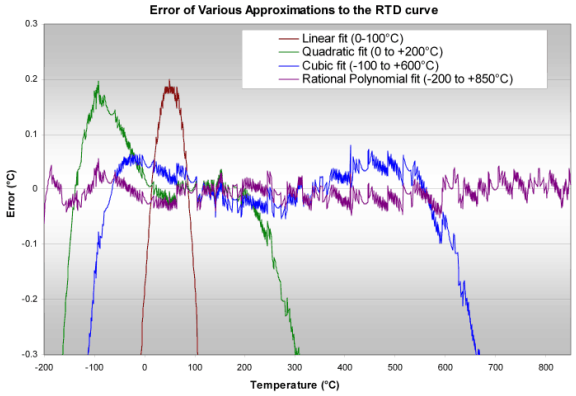

fig:- error at various approximations

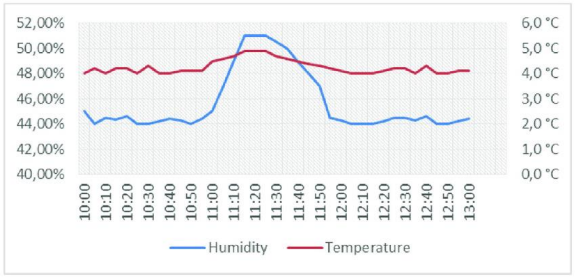

Fig. 9. Test measurement of sensor network

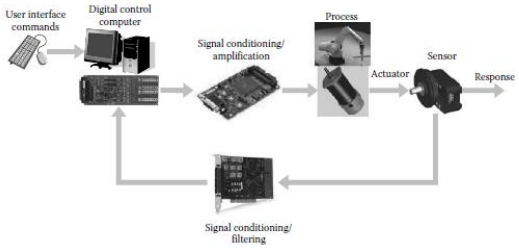

Fig. 10. Wireless sensor system networks

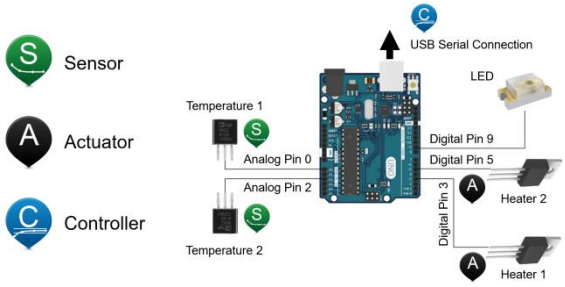

Fig. 11. Schematic diagram of circuit system

The high performance function and increased lifetime will make it more suitable for any highly dry or wet weather conditions where sensors get deteriorated very easily and lifetime and performance decreases. The asynchronization and full duplex operation is making it worthy for any circumstances use.

8. Conclusion

Wireless Sensor Networks (WSNs) have undergone in the last few years a tremendous growth, both in industry and in academia. This is mainly due to the different

Potentials of this technology such as: The wire cost is reduced with the use of wireless sensor nodes. The wire cost is actually becoming more and more prominent in the deployment of sensor networks. Moreover, wires imply maintenance costs; application domains that were inaccessible to wired sensor nodes are now at reach thanks to miniaturized wireless measurement devices.

However, WSNs also need to face significant design challenges because of their limited computing and storage capabilities and also their dependence on limited energy as the sensor nodes are usually supplied by a battery. The energy is a critical resource and it often constitutes a major obstacle to the deployment of sensor networks that will be used everywhere in the world of tomorrow. This is focused on energy/power management for a set of sensor nodes, and security management and variable maximum and minimum temperature work with a particular emphasis on energy conservation at the application level.

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