

A Wearable Belt for Detecting and Monitoring the Hernia, Appendicitis and Spinal Cord Injury

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ABSTRACT: A method for providing a detecting and monitoring of Hernia, Appendicitis and Spinal cord injury process by magneto elastic strain sensors, MEMS, pressure sensor, ultrasonic sensor the hernia often occur after the surgery to patients. The appendicitis is occur due to constipation and loss of fibre content in the body and spinal cord injury is occurred by accidents. the sensors are used to diagnosis of diseases in earlier stage which is not leads to severe situations . magneto elastic strain sensor ae used to detect the hernia . ultrasonic sensor is detect appendicitis and MEMS is used to detect spinal cord injury and pressure sensor are used to monitor the pressures in the body In these infrared method are used to detection of diseases using a respective sensors.

KEYWORDS: Hernia, appendicitis spinal cord injury and infrared method

I. INTRODUCTION

HERNIA

Hernia is occur due to bulging of abdominal tissues and organs and it is mostly occurred after the surgery is done and also 50 years old people and it has symptoms which cause a pain in the abdominal region and also its symptoms are constipation or diarrhea . using magneto elastic strain sensor to detect the hernia in the earlier stage it is leads to 5 million of people are fatal per year and this method are used to protect from the people.

APPENDICITIS

Appendicitis is caused by the blockage in the appendix and also sometimes it is inflamed in the appendix .and it has symptoms which is leads to constipation and loss of fibre content in the body .the rupture is occur in the appendix is leads to the fatal to the patient.and it is help to diagnose in the earlier stage by ultrasonic sensor which is not leads to the critical stage and it helps to the people to prevent from their critical stages.

SPINAL CORD INJURY

In these spinal cord injury is often caused by accidents and it has a two stages which is complete and incomplete stages in these incomplete stages are detected in earlier stages which is not leads to complete stage in these stages are leads to patients to bed of bedding .it is using MEMS sensor which is diagnose of patient in incomplete stages.

II. METHODOLOGY

To detect hernia, appendicitis and spinal cord injury by using pressure sensor, magneto elastic strain sensor, ultrasonic sensor, micro electromechanical system sensor in infrared rays. In these hernia is sensed by using a magneto elastic strain sensor In these are sensor are detected by measuring value is proportional to the strain. In these it consists a both transducer and resonator.

In coupled magneto elastic approach that combines a transducer with integrated springs with an encased resonator to achieve high dynamic range with good SNR. The dynamic range and sensitivity of the sensor can be tuned through adjustments in the spring design of the transducers to measure up to maximum range of process. In addition, multiplexed measurements are possible within a single measurement sweep by arraying resonators of varying lengths.

Appendicitis are sensed by using a MEMS sensor in these sensor is proportional to the vibration in the appendix .spinal cord injury has a two stages .one is complete and another is incomplete.in these sensor can be detect the incomplete spinal cord injury.it is sensed by the ultrasonic sensor which is radiation are pass to the object and it reflect to the sensor in pressure sensor are used to detect any pressure changes occur in the body.

PIC MICROCONTROLLER

In these programmable interface controller has a 8 bit microcontroller unit .in these 16F877A is one of the most popular PIC microcontrollers.it has 40 internal peripherals and it gives a result is more accurate than others.

PRESSURE SENSOR

Pressure sensor is used to measure pressure in human body and range is 80-120.when the pressure applied to sensor,then the pressure sensor converting the pressure into electrical signal. Normally pressure sensor react proportionally to a force applied in older days ,strain gauge is used in pressure sensor to measure the force. Nowadays,capacitance or piezoelectric sensor is used instead of strain gauge.

ULTRASONIC SENSOR

Ultrasonic sensors also known as transceivers which has a both transducer and receiver.it works as a when the radiation pass into object and it reflects to the microcontroller.It work on a principle similar to radar or sonar which evaluate attributes of a target by interpreting the echoes from radio or sound waves respectively.Ultrasonic sensors generate high frequency sound waves and evaluate the echo which is received back by the sensor

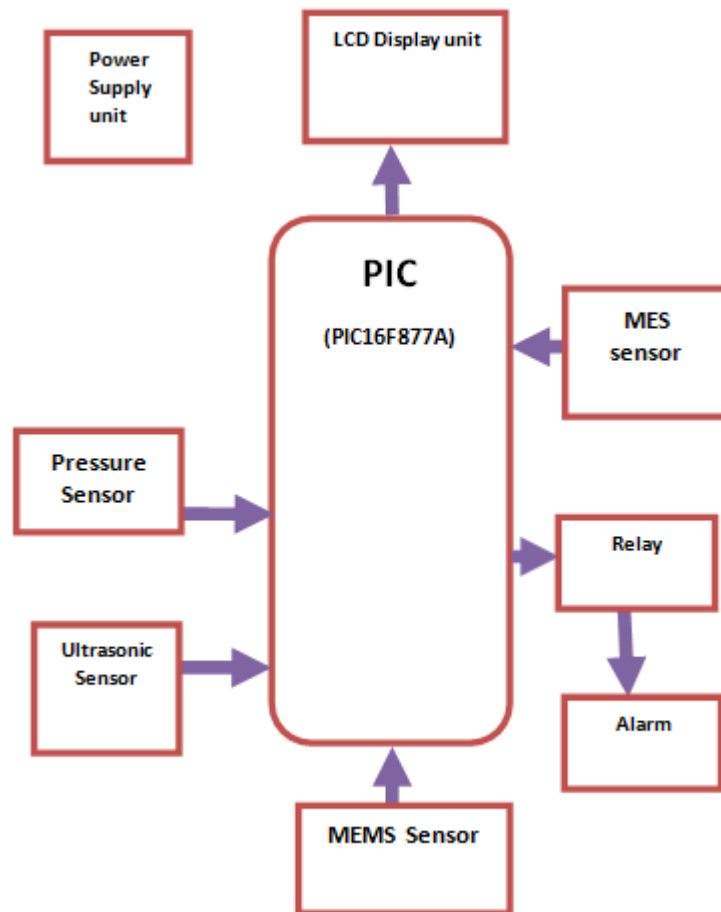


Fig.1. Proposed Model

MEMS SENSOR

A device used to measure a physical quantity (such as temperature) and convert it into an electronic signal of some kind (e.g. a voltage), without modifying the environment. MEMS or Micro-Electro Mechanical System is a technique of combining Electrical and Mechanical components together on a chip, to produce

asystemofminiaturedimensions.MEMSiSte integration of a number of micro components on a single chip which allows the micro system to both sense and control the environment.The components are integrated on a single chip using micro fabrication technologies.

MES SENSOR

MES are made of amorphous metallic glass ribbons and are wireless and passive.It is convenient to monitor or measure the parameters related to biomedical engineering.An MES used for monitoring bone plate strain in real-time, and for judging the healing state of fractures in patients.The results can be used not only in the clinical application of fracture healing, but also in the design of fracture treatment and rehabilitation equipment.

RESULT

In these device are able to diagnose the diseases such as hernia,appendicitis and spinal cord injury .as a result it is reduced from the critical stages to the patient.it also used ecofriendly to the patient .

III.CONCLUSION AND FUTURE SCOPE

As infrared method for providing a diagnose of hernia, appendicitis and spinal cord injury which is preventing from their critical stages. In these system are used to patient considering a defined criterion based and embedded device,furthermore , the large number and variety of available sensors for vital sign monitoring , showed that there is a huge care from physicians in order to decreasing the overcrowding of medical services.In this instrument are used to monitoring the hernia,appendicitis and spinal cord injury.for future work it is detect earlier stage without has any symptoms and also for adding a sensors for more accurate.

REFERENCES

- [1] T. N. Robinson, J. H. Clarke, J. Schoen, and M. D. Walsh, "Major mesh-related complications following hernia repair: events reported to the Food and Drug Administration.," *Surg. Endosc.*, vol. 19, no. 12, pp. 1556–60, Dec. 2005.
- [2] G. K. Gillian, W. P. Geis, and G. Grover, "Laparoscopic incisional and ventral hernia repair (LIVH): an evolving outpatient technique.," *JLS*, vol. 6, no. 4, pp. 315–22, 2002.
- [3] A. Kingsnorth and K. Leblanc, "Hernias[4] : inguinal and incisional," *Lancet*, vol. 362, no. 9395, pp. 1561–1571, 2003.
- [4] B. K. Poulouse et al., "Epidemiology and cost of ventral hernia repair: Making the case for hernia research," *Hernia*, vol. 16, pp. 179–183, 2012.
- [5] Sana Ansari,fariasajjid,ziaulqayyum"diagnosis of vertebral clearingclassifiers"IEEE, Vol.3, Number 4, pp.45-67, 2013
- [6] A.kingsnorth and K.leblanc,"hernias: inguinal and incisional," *Lance*, vol.362,no.9395,pp1561-1571,2018