ADVANCE VEHICLE TRACKING SYSTEM WITH HEALTH DATABASE

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Abstract- In a critical situation many vehicles faces accident, due to this lot of person lost their lives. Some people can be saved at that time, but because of lack of information, time and place it may not be possible. Our project will provide an optimum solution to that draw back. An accelerometer can be used in a car alarm application; Dangerous driving can be detected with an accelerometer. It can be used as a crash recorder of the vehicle movements before, during and after a crash. With signals from an accelerometer, a severe accident can be recognized. According to this project when a vehicle met with an accident immediately the vehicle number and persons contact number will be transferred to police control room or a rescue team. So the police can immediately trace the location from where the message came. Then after conforming the location necessary action will be taken. In second application on an uncertain situation many of vehicle that has center locking system, Such as door locking system faces many problem due to automatic locking system. At that situation there is no way to open the lock. Our project will provide a suitable solution for this situation. This can be done by using wireless or GSM Technology

*Keywords-ARM, GPS,GSM,RF, Sensors module*

I .INTRODUCTION

When a vehicle met with an accident the message came to control room or a rescue team by using GPS and GSM Technology. GPS is a fleet of more than 24 communications satellites that transmit signals globally around the clock. With a GPS receiver, one can quickly and accurately determine the latitude, the longitude, and in most cases the altitude of a point on or above Earth's surface. GSM use a Subscriber Identity Module (SIM) smart card that contains user account information. Any GSM phone becomes immediately programmed after plugging in the SIM card, thus allowing GSM phones to be easily rented or borrowed. Here an accelerometer (MEMS)

is used in a car alarm application; MEMSENSER is a powerful yet simple software tool for engineers, researchers and students working in the field of Micro Electro Mechanical Systems Dangerous driving can be detected with an accelerometer. It can be used as a crash recorder of the vehicle movements before, during and after a crash. With signals from an accelerometer, a severe accident can be recognized. According to this project when a vehicle met with an accident immediately the vehicle number and persons contact number will be transferred to control room or a rescue team. So the rescue team can immediately trace the location from where the message came. Then after conforming the location necessary action will be taken. In second application on an uncertain situation many of vehicles that have center locking system, Such as door locking system faces many problems due to automatic locking system. At that situation there is no way to open the lock. Our project will provide a suitable solution for this situation
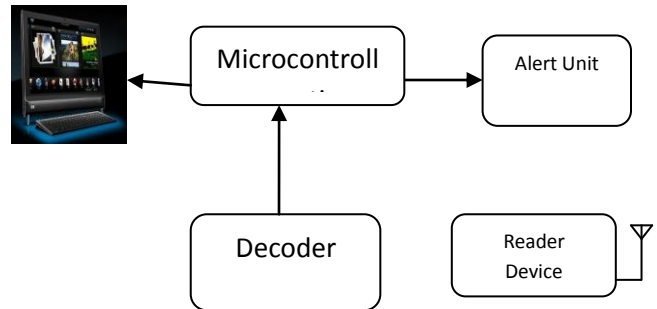
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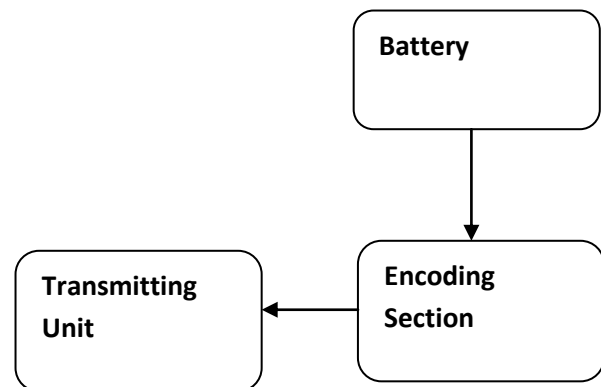
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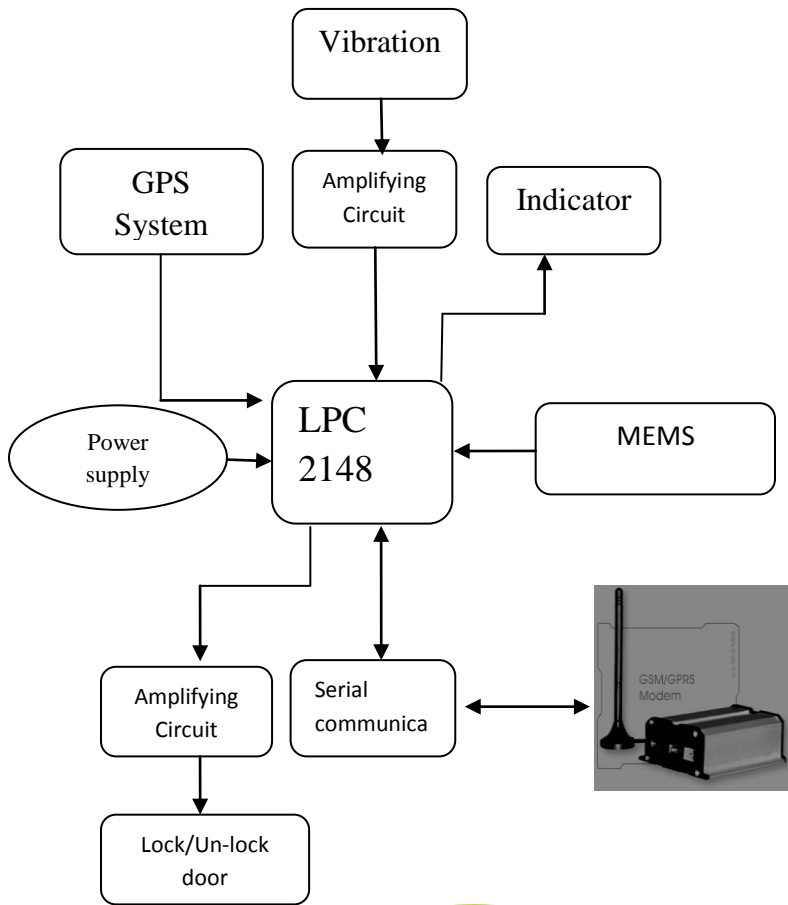
Medical Section

II. MEMS Technology:

Micro-Electro-Mechanical Systems (MEMS) is the integration of mechanical elements, sensors, actuators, and electronics on a common silicon substrate through micro fabrication technology.MEMS is an enabling technology allowing the development of smart products, augmenting the computational ability of microelectronics In most cases, the physics behind the behavior of MEMS devices can be expressed by mathematical expressions. MEMSolver works by creating a mathematical model of the system and generates analytical solutions to explain the behavior of the MEMS device. The user just has to enter the input parameters like length and width of the beam for example in a user friendly GUI, and the software will immediately calculate the relevant results and plot graphs that fully explain the MEMS device or part of it.

The software is divided into five modules namely mechanics, sensing, actuation, and process and data analysis. Mechanics module is subdivided into three sub sections. The first subsection being structures where the most commonly used beams and diaphragm designs are examined. The second subsection discusses vibration of these structures, both free and forced vibrations. The third subsection discusses damping in the form of squeeze film and slide film damping. Sensing module discusses sensing

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schemes widely used in MEMS namely piezoresistive and capacitive sensing for designing pressure sensors and accelerometers. Actuation module examines the two widely used means of actuation namely electrostatic and thermal applied to some commonly used actuators like parallel plate, micro mirror, comb drive, bimetallic and bimorph actuators. Process module is divided into six subsections namely lithography, oxidation, diffusion, implantation, film deposition and wet etching. This covers some of the most commonly used processes used in the development of MEMS devices. The data analysis module has a die calculator, unit conversion tool and lists the material properties of commonly used MEMS materials
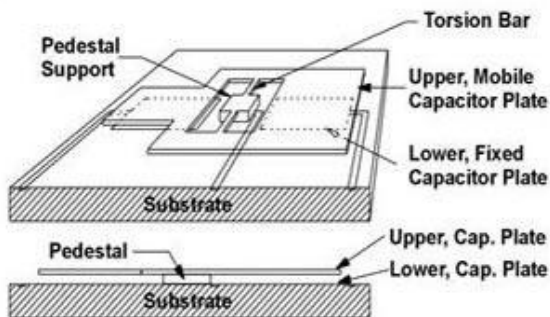
The increasing demand for MEMS (micro-electromechanical systems) technology is coming from diverse industries such as automotive, space and consumer electronics. MEMS promises to revolutionize nearly every product category by bringing together silicon-based microelectronics with micromachining technology, making possible the realization of complete systems-on-a-chip. KLA-Tenor offers the tools and techniques, first developed for the integrated circuit industry, for this emerging market.

MEMS AND COMPLIANT MEMS

Micro-electro-mechanical systems (MEMS) technology has contributed to the improved performance, reliability and lower-cost sensors that support basic automobile functions within the automotive industry. MEMS technology is expected to play an important role in the future of Research and Development of automotive industry [4]; particularly in the active safety area. MEMS sensors have the following advantages: they are deterioration-free and are durable for long periods; they have good dynamic characteristics, superior impact resistance, low power consumption, low cost, they are small in size, and easy for installation. MEMS are considered to be as a key technology with potential to meet the requirements of the Intelligent Transportation Technology (ITS). MEMS sensors used in automotive systems etc. usually comprise micro beams and inertial mass formed by etching part of a silicon substrate, and piezo-resistors formed as strain gauges on the beams. Applications of MEMS sensors are not limited to airbag systems. They are also used in vehicle motion control systems, for example in the Antilock Braking System (ABS). Crash sensors can detect and calculate crash parameters such as velocity and acceleration. Existing technologies for active safety are being modified using MEMS sensors to enhance the performance of current systems; such as airbags or belt pre-tension devices. These systems reduce the risk of injury and its level during a crash which motivates the development of Intelligent Safety Systems (ISS). In this research two compliant MEMS designs are introduced as shown in Figures 1-2. These mechanisms work on the principle of large deflecting arcs and the beams and achieve motion by the deflection of their members. Prescribed motion profiles can be obtained more easily using buckling members in compliant mechanism design [5]. If these mechanism's members were rigid the mechanism would have zero degree of freedom.

III.VIBRATION SENSOR

Vibration sensors detect the vibration of the ground soil in case of a debris flow. Prior to installing a vibration sensor, it is extremely important to determine what level of vibration is appropriate to activate the sensor in case of a debris flow. It is also important to keep in mind the risk of unintentional activation caused by earthquakes, as well as areas in which there is construction traffic and other vibration causes that may activate the sensor.

- Machinery damage and costly production delays caused by unforeseen machinery failure can be prevented.
- When pending problems are discovered early, the plant engineer has the opportunity to schedule maintenance and reduce downtime in a cost effective manner.

- Vibration analysis is used as a tool to determine machine condition and the specific cause and location of machinery problems.
- This expedites repairs and minimizes costs

IV.GPS MODULE:

The Global Positioning System (GPS) comprises three segments:

- The space segment (all functional satellites)

- The control segment (all ground stations involved in the monitoring of the system master control station, Monitor stations, and ground control stations)

- The user segment (all civil and military GPS users).

GPS Was developed by the U.S. Department of Defense (DOD) and can be used both by civilians and military Personnel. The civil signal SPS (Standard Positioning Service) can be used freely by the general public, whilst the Military signal PPS (Precise Positioning Service) can only is used by authorized government agencies. The first Satellite was placed in orbit on 22nd February 1978, and there are currently 28 operational satellites orbiting the Earth at a height of 20,180 km on 6 different orbital planes. Their orbits are inclined at 55° to the equator, ensuring that at least 4 satellites are in radio communication with any point on the planet.

During the development of the GPS system, particular emphasis was placed on the following three aspects:

a) It had to provide users with the capability of determining position, speed and time, whether in motion at rest.
b) It had to have a continuous, global, 3-dimensional positioning capability with a high degree of accuracy, Irrespective of the weather.
c) It had to offer potential for civilian use

civil use. System accuracy had been intentionally degraded up until May 2000 for political and tactical reasons by the U.S. Department of Defense (DOD), the satellite operators. It was shut down in May 2000, but it can be started up again, if necessary, either on a global or regional basis.

V. Medical Section

(a).*RF transmitter and receiver*

Radio Frequency, any frequency within the electromagnetic spectrum associated with radio wave propagation. When an RF current is supplied to an antenna, an electromagnetic field is created that then is able to propagate through space. Many wireless technologies are based on RF field propagation Radio Frequency: The 10 kHz to 300 GHz frequency range that can be used for wireless communication. Also used generally to refer to the radio signal generated by the system transmitter, or to energy present from other sources that may be picked up by a wireless receiver.

(b)Transmitter

The TWS-434 extremely small, and are excellent for applications requiring short-range RF remote controls. The transmitter module is only 1/3 the size of a standard postage stamp, and can easily be placed inside a small plastic enclosure.

TWS-434: The transmitter output is up to 8mW at 433.92MHz with a range of approximately 400 foot (open area) outdoors. Indoors, the range is approximately 200 foot, and will go through most walls.

(c)Receiver

RWS-434: The receiver also operates at 433.92MHz, and has a sensitivity of 3uV. The WS-434 receiver operates from 4.5 to 5.5 volts-DC, and has both linear and digital outputs.

(d)Transmitting and receiving

Full duplex or simultaneous two-way operation is not possible with these modules. If transmit and receive module are in close proximity and data is sent to a remote receive module while attempting to simultaneously receive data from a remote transmit module, the receiver will be overloaded by its close proximity transmitter. This will happen even if encoders and decoders are used with different address settings for each transmitter and receiver pair. If two way communications is required, only half duplex operation is allowed
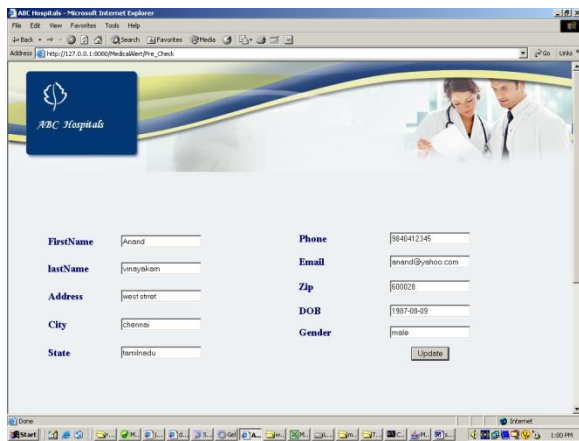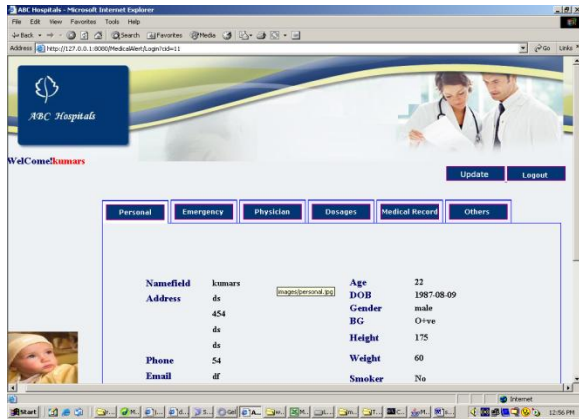
Screen for Medical data storing

VI.Relay circuit

The coil of a relay passes a relatively large current, typically 30mA for a 12V relay, but it can be as much as 100mA for relays designed to operate from lower voltages. Hence a CB amplifier is used to achieve the current rating of the relay.

Transistors and ICs must be protected from the brief high voltage produced when a relay coil is switched off. The diagram shows how a signal diode (e.g. 1N4148) is connected 'backwards' across the relay coil to provide this protection. Current flowing through a relay coil creates a magnetic field which collapses suddenly when the current is switched off. The sudden collapse of the magnetic field induces a brief high voltage across the relay coil which is very likely to damage transistors and ICs. The protection diode allows the induced voltage to drive a brief current through the coil (and diode) so the magnetic field dies away quickly rather than instantly. This prevents the induced voltage becoming high enough to cause damage to transistors and ICs.
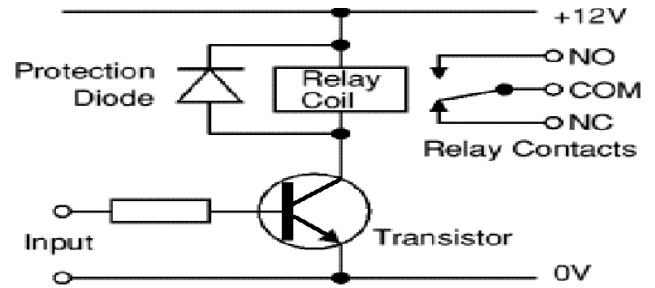
VII.Introduction Of GPRS And Transmission Module

The General Packet Radio Service (GPRS) is a connectivity solution based on Internet Protocols supporting a wide range of enterprise and consumer applications available now with almost every GSM network. GPRS is a method of enhancing 2G phones to enable them to send and receive data more rapidly. It promises data rates from 56 up to 114 Kbps and continuous connection to the Internet for mobile phone and computer users. GPRS supports a number of data services such as Short Message Service (SMS), Multimedia Messaging Service (MMS), Wireless Application Protocol (WAP) access, as well as Internet communications services. Additionally GPRS customers enjoy a number of advanced, feature-rich data services such as colour Internet browsing, e-mail on the move, video streaming, multimedia messages and location-based services. GPRS data transfer is typically charged per megabyte of traffic transferred, while data communication via traditional circuit switching is billed per minute of connection time, independent of whether the user actually is using the capacity or is in an idle state. GPRS is a best-effort packet switched service, as opposed to circuit switching, where a certain quality of service (QoS) is guaranteed during the connection for non-mobile users. 2G cellular systems combined with GPRS are often described as "2.5G", that is, a technology between the second and third generations of mobile telephony

Prioritizing easy operation, a GPRS module SIM300 provided by Simcom is chosen to be the transmitter/receiver so that the user could send his/her ECG signals at anytime wherever GSM coverage is present.

SIM300 is a Tri-band GSM/GPRS engine that works on frequencies EGSM 900 MHz, DCS 1800 MHz and PCS1900 MHz. SIM300 provides GPRS multi-slot class 10 capability and support the GPRS coding schemes CS-1, CS-2, CS-3 and CS-4.With a tiny configuration of 40mm x 33mm x 2.85 mm, SIM300

can fit almost all the space requirement in your industrial application, such as M2M, Telematics and other mobile data communication systems. SIM300 provides all hardware interfaces between the module and customers' boards except the RF antenna interface. The two serial ports can help you easily develop your applications. It is designed with power saving technique, the current consumption to as low as 2.5mA in SLEEP mode. Also the SIM300 is integrated with the TCP/IP protocol, Extended TCP/IP AT commands are developed for customers to use the TCP/IP protocol easily, which is very useful for those data transfer applications

.Communication between the microcontroller and the SIM300 is made through an UART interface. It has been set to 57600bps, 8-bit data, 1 stop bit and non parity. The module transmits the data grouped in logical frames. And it can be used as a modem in a computer system to connect to Internet; even there is no TCP/IP protocol stack in the software. These ensure the security of data transmission. GPRS facilitates instant connections whereby information can be sent or received immediately as the need arises.

In order to develop the ECG related software just like developing application software in Personal Computer (PC), the system uses an Operating System (OS) named uClinux. uClinux is a Linux derivative intended for microcontrollers without Memory Management Unit (MMU). It's free and open source software under GNU Public License. The original uClinux is a derivative of Linux 2.0 kernel intended for microcontrollers without Memory Management Units (MMUs). However, the Linux/Microcontroller Project has grown both in brand recognition and coverage of processor architectures. Today's uClinux as an operating system includes Linux kernel releases for 2.0 2.4 and 2.6 as well as a collection of user applications, libraries and tool chains. The uClinux is much smaller than Linux kernel while retaining the main advantages of Linux OS: stability, superior network capability and excellent file system support. We ported uClinux operating system on the NXP LPC2148 platform and the Embedded Operating System (EOS) supports a lot of kernel functions to handles interrupt, timer, task schedule and resources management of hardware. First of all, the firmware system will do initialization of UART, A/D conversions, LCD controller, and then create ECG data acquisition task, data transmission task, timer task, ISR task and so on.
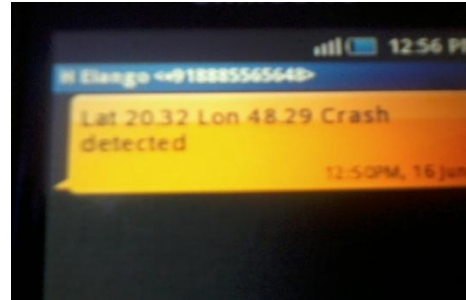
VIII.Conclusion

This paper presents an introduction to two novel compliant crash sensor designs. These compliant MEMS designs are expected to lower the cost of the crash sensors. The kinematic analysis of both sensors is presented and the dynamic simulation example of the first design subject to a pulse force is studied. The detailed dimensional design methodologies of both complaint MEMS needs to be done considering falsifying impact inputs and sending the signal when the real impact is present in Future studies. More than one design architecture or combination of several introduced micro designs side by side might be used to determine the severity of the impact. For example: One compliant MEMS can be design to activate the switch for the crash acceleration range 10 g's and crash time less than 20 msec. and the other one the crash acceleration range 50 g's and time greater than 100 msec etc. The complete dynamic design methodology and electronic IC units of these sensors are planned for near future studies.

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