

VEHICLE NAVIGATION WITH ACCIDENT MESSAGING SYSTEM

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ABSTRACT

A new approach to Gathering data for Intelligent Transportation System applications over a continuous-flow of traffic rather than at discrete locations, as is the case with many existing technologies. The detailed algorithms means complete navigation solution, including attitude, position and velocity of the vehicle respectively. This kind of integrated navigation consists of inertial navigation based on MEMS, GPS and magnetometer, the goal of research presented in this paper is to provide some frontier study for the development and research of the intelligent transportation system.

EXISTING SYSTEM

The Existing system of integrated navigation consists of , the electronics are fabricated using integrated circuit (IC) process sequences (e.g., CMOS, Bipolar, or BICMOS processes), the micromechanical components are fabricated using compatible "micromachining" processes that selectively etch away parts of the silicon wafer or add new structural layers to form the mechanical and electromechanical devices.

PROPOSED SYSTEM

We propose to implement to develop a device that informs the control station if the vehicle in which the device is fitted, met with a severe accident, Also the device tracks the movement of vehicles by sending the position details of the

vehicle to the control station. This project is implemented using an accelerometer sensor which works using MEMS (Micro-Electro-Mechanical System) technology along with GSM (Global System for Mobile Communication) and Global Positioning System (GPS).

Types of Sensors available

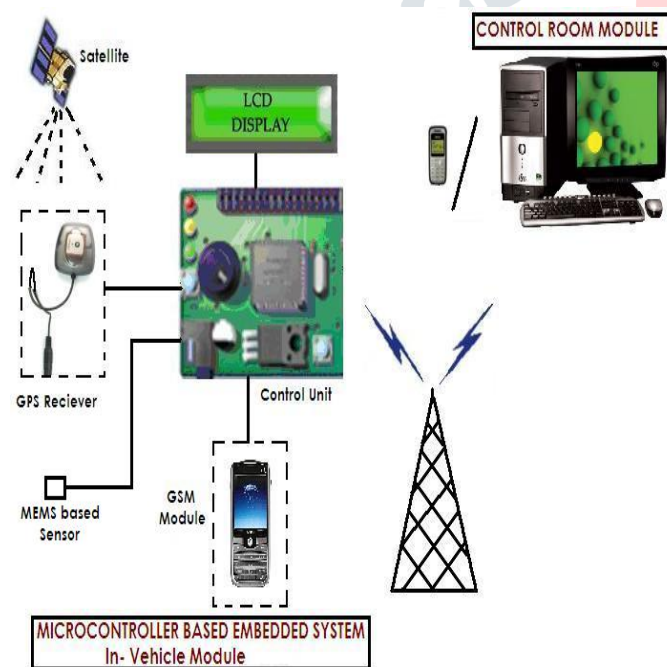
Popular sensor technologies based on MEMS – MicroElectroMechanical promises to revolutionize nearly every product category by bringing together silicon-based microelectronics with micromachining technology, making possible the realization of complete systems-on-a-chip. MEMS is an enabling technology allowing the development of smart products, augmenting the computational ability of microelectronics with the perception and control capabilities of micro sensors and micro actuators and expanding the space of possible designs and applications.

The GPS module calculates the geographical position of the module. This helps in detecting the location/position of the module. The GPS system functions on the basis of NMEA protocol. The NMEA protocol has output messages and input messages. The module outputs data like Global positioning system fixed data, Geographic position – latitude/longitude, GNSS DOP and active satellites, GNSS satellites in view and recommended minimum specific GNSS data.

The GSM Terminal is an industrial GSM Modem for the transfer of data, SMS and faxes in the GSM networks. Industrial standard interface and an integrated SIM card mean it can be used rapidly, easily and universally as a dual band GSM Terminal. Its performance bandwidth and the robust housing make it easier to quickly implement new applications in areas such as telemetry, telematics and remote control.

Advantages

- Cost is to be less
- Memory is more efficiently used by the processors
- To perform all the tasks at a time



GSM (Global System for Mobile communication)

It is a digital mobile telephony system that is widely used in Europe and other parts of the world. GSM uses a variation of time division multiple access (TDMA) and is the most widely

used of the three digital wireless telephony technologies (TDMA, GSM, and CDMA). GSM digitizes and compresses data, then sends it down a channel with two other streams of user data, each in its own time slot. It operates at either the 900 MHz or 1800 MHz frequency band.

Since many GSM network operators have roaming agreements with foreign operators, users can often continue to use their mobile phones when they travel to other countries. SIM cards (Subscriber Identity Module) holding home network access configurations may be switched to those will metered local access, significantly reducing roaming costs while experiencing no reductions in service.

Global Positioning System (GPS)

Global Positioning System (GPS) is a U.S. space-based radio navigation system that provides reliable positioning, navigation, and timing services to civilian users on a continuous worldwide basis -- freely available to all. For anyone with a GPS receiver, the system will provide location and time. GPS provides accurate location and time information for an unlimited number of people in all weather, day and night, anywhere in the world. The GPS is made up of three parts: satellites orbiting the Earth; control and monitoring stations on Earth; and the GPS receivers owned by users. GPS satellites broadcast signals from space that are picked up and identified by GPS receive. Each GPS receiver then provides three-dimensional location (latitude, longitude, and altitude) plus the time. Individuals may purchase GPS handsets that are readily available through

commercial retailers. Equipped with these GPS receivers, users can accurately locate where they are and easily navigate to where they want to go, whether walking, driving, flying, or boating.

MEMS

Micro-Electro-Mechanical-Systems (MEMS) are machines which range in size from a micrometer to a millimeter, they may function as actuators, motors, generators, switches, sensors... and have applications in fields as diverse as telecommunications, automotive and aerospace, astronomy and ophthalmometry, biotechnology, logistics...

Common examples include:

- inkjet printers
- accelerometers (airbag deployment...)
- gyroscopes (trigger dynamic stability control...)
- pressure sensors (car tires, blood...)
- displays (projectors...)
- optical switching technology (telecommunications)
- -Bio-MEMS (Lab-On-Chip, Micro Total Analysis...)

Why are MEMS of interest?

MEMS are of interest for many reasons:

COST :

Batch processing of MEMS using techniques developed by the microelectronics industry means that the price of an individual machine is very low (some costing no more than a few cents !).

SIZE :

Their small size means that they don't take up much space and weigh little, with obvious benefits for portable applications (mobile phones, aerospace devices ...) or applications with space limitations (implantable devices, micro-surgery,.....).

ENERGY EFFICIENCY :

MEMS hold great potential for the environment: they already increase fuel efficiency in modern cars and houses of the future will intelligently control energy consumption, by exploiting MEMS to regulate temperature and lighting in accordance with need (ambient temperature + human presence).

INTELLIGENT MACHINES:

As MEMS are made using microelectronics technology, electro-mechanical elements can be integrated with electronics onto one substrate, the former acting as the arms and legs of the machine, the latter as the brain.

MMA1250D

The MMA series of silicon capacitive, micro machined accelerometers features signal conditioning, a 2-pole low pass filter and temperature compensation. Zero-g offset full scale span and filter cut-off are factory set and require no external devices. A full system self-test capability verifies system functionality.

Features

- Integral Signal Conditioning
- Linear Output
- 2nd Order Bessel Filter
- Calibrated Self-test
- EPROM Parity Check Status

• Transducer Hermetically Sealed at Wafer Level
for Superior Reliability

• Robust Design, High Shock Survivability

Typical Applications

• Vibration Monitoring and Recording

• Appliance Control

• Mechanical Bearing Monitoring

• Computer Hard Drive Protection

• Computer Mouse and Joysticks

• Virtual Reality Input Devices

• Sports Diagnostic Devices and Systems

FUTURE ENHANCEMENTS

The future enhancements of the proposed system can be supposed to perform effectively as following:

- If we are supposed to give an additional input to the system, the system should be able to handle the given input.
- Currently 32 bit processor which is used and can be extended in the future by 64 bit processor

CONCLUSION

In this paper, **VEHICLE NAVIGATION WITH ACCIDENT MESSAGING SYSTEM** is a method which separate functions (or tasks) of the monitoring system independently. The benefit of MEMS system, which executes the multiple-tasks simultaneously. The vehicles parameters which changes day by day in vehicle, and to prevent the most dangerous condition of the vehicle by automatic controlling the vehicle and informing to the control station. The derived results are informed to the manufacturer which will be used

at the time of service. Thereby by we conclude the life of the passenger in the vehicle, saved in most of the cases. The system that is intended primarily to improve safety would have a different design from the system to improve comfort and convenience.

Indeed, why should we think in terms of “intelligent vehicles” unless those vehicles are interacting intelligently with each other and with their supporting roadway infrastructure to form an intelligent transportation system? Even a vehicle that could pass the Turing Test of “intelligent” conversation with a human would not be of much use. This conundrum can only be avoided if the automated vehicles are designed to operate only in cooperation with other automated vehicles, physically separated from non automated vehicles.

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