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Review on Vehicle Data Acquisition and Crash Prediction Using ARM7

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Abstract— This paper focuses on the use of infrared collision detection in cars. The infrared sensors are used to measure the distance from another vehicle in close proximity, to estimate relative position of the vehicle from the measurements[3]. The use of infrared sensors in order to measure small intervehicle distance of the automotives. The sensor system is based on the use of IR sensors, which measure object distance from vehicle. While accelerometer have used to measure speed of vehicle. A system based on the use of sensors and a custom-designed of telemetry system which can develop to estimate vehicle parameters and position [2].

Keywords— DAQ, Crash prediction, ARM7

I. INTRODUCTION

Modern automobiles are becoming increasingly electromechanical and even the parts that remain mechanical are being tuned to work more efficiently by drawing data via sensors monitoring them. The Data Acquisition system is highly essential, whereas the telemetry option is used only to monitor for safety. Here we focus on the collision detection in cars and DAQ system design. The sensors are used to measure the data for telemetry system, and crash prediction, when it sense data from another vehicle in close proximity, to estimate relative position, velocity, and orientation of the vehicle from the measurements[2].

The work will be motivated by the need to develop an inexpensive sensor system for an automobile that can predict an imminent collision with another vehicle, just before the collision occurs. The prediction needs to occur at the earliest condition the collision, so that there is adequate time to initiate active passenger protection measures to protect the occupants of the vehicle during the crash. The sensor field create alert signal for the whole vehicle, which can be analytically modelled as a function of vehicle-specific parameters and position around the vehicle. By measuring the sensor field using IR sensors we can predict accident situation[3]. The accelerometer can estimate speed of the vehicle. Here proposed system will give alert signal for over speed of the vehicle to the driver. If speed will increase at its maximum stage system can provide SMS to control centre for taking better security. Here proposed system also indicates for accidental condition which can help to get necessary action on field[1]. However, the specific parameters vary from one type of vehicle to another type of vehicle. Hence, these parameters can be addressed by the use of sensors.

The presence of an automobile in close range to a sensor causes a change in the sensor status, which changes the state of controller. By measuring the data & obtaining the real-time distance and developing models that relate with intervehicle position, estimation systems for intervehicle distance estimation can be developed. Here also we use the telemetry and DAQ system. It is vital to the development phase of a vehicle so that designs can be validated and tuneable parameters adjusted to increase performance and efficiency.

II. LITERATURE REVIEW

[1]**Vehicle Data Acquisition and Telemetry**
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The system discussed in this paper was designed specifically for automotive application, taking into account the size, cost and performance, while also taking care of the noise factor by including digital filters. DAQ and Telemetry systems have evolved substantially over the years, and are being used to gather data from a sources in order to aid development of newer products, monitoring and control, surveillance and so on.

2] **Two-Dimensional Sensor System for Automotive Crash Prediction**

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This paper focuses on the use of magnetoresistive and sonar sensors for imminent collision detection in cars. The magnetoresistive sensors are used to measure the magnetic field from another vehicle in close proximity, to estimate relative position, velocity, and orientation of the vehicle from the measurements. First, an analytical formulation is developed for the planar variation of the magnetic field from a car as a function of 2-D position and orientation. While this relationship can be used to estimate position and orientation, a challenge is posed by the fact that the parameters in the analytical function vary with the type and model of the encountered car.

III. METHODOLOGY

3.1. Block diagram.

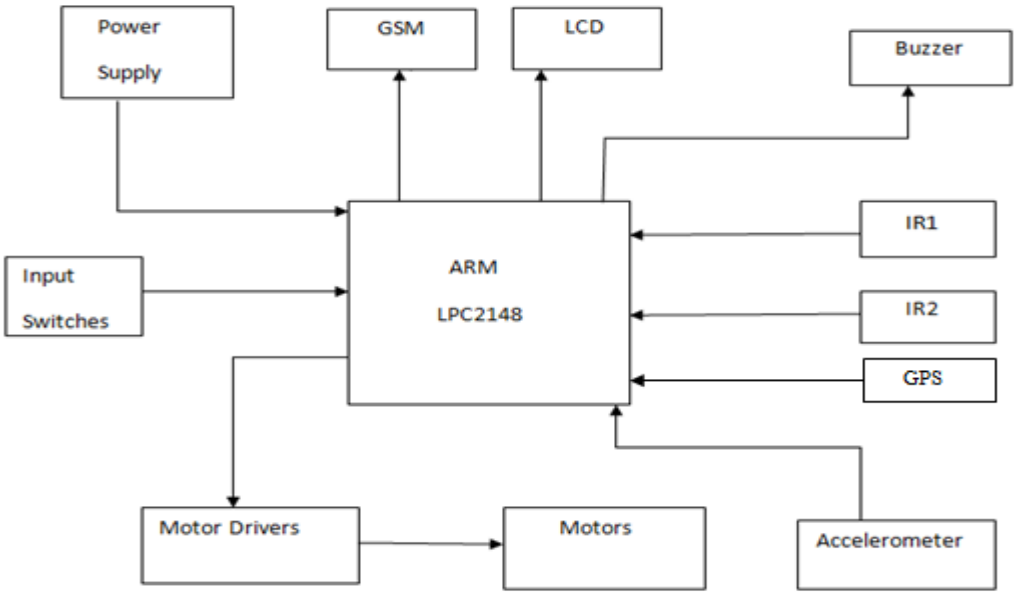

Figure 1. Block diagram

In the above setup, the sensor inputs are given to an embedded controller which is programmed to perform signal conditioning and analog to digital conversion using the onboard ADCs. Since most of the inputs from vehicle sensors are around 0-5V for voltage based readings and 4-20mA for current based, this was the basis of choosing the final specification of the system. The IR sensors are interfaced with any port pin of ARM LPC2148 which gives output for object detection in vehicle front and back side. The accelerometer is used to measure speed of vehicle. Here for demo we are running separate motors with robot chassis. The speed of motor is identified by accelerometer and provided to telemetry system. The speed limit can be set by designer so that driver cannot go beyond the given speed limit. If it is exceed the speed limit we can get SMS alert to control centre. The system can also give reply via display and buzzer. The object detection can be used to measure if any other object is coming very close to vehicle which can cause accidental situation. Here proposed system have data acquisition system provided to control centre. The control centre will have another

GSM module to receive data from vehicle ARM unit. This received SMS we can read by the help of VB software. This also save telemetry data in control centre PC provided by vehicle ARM unit.

3.2. Flow chart.

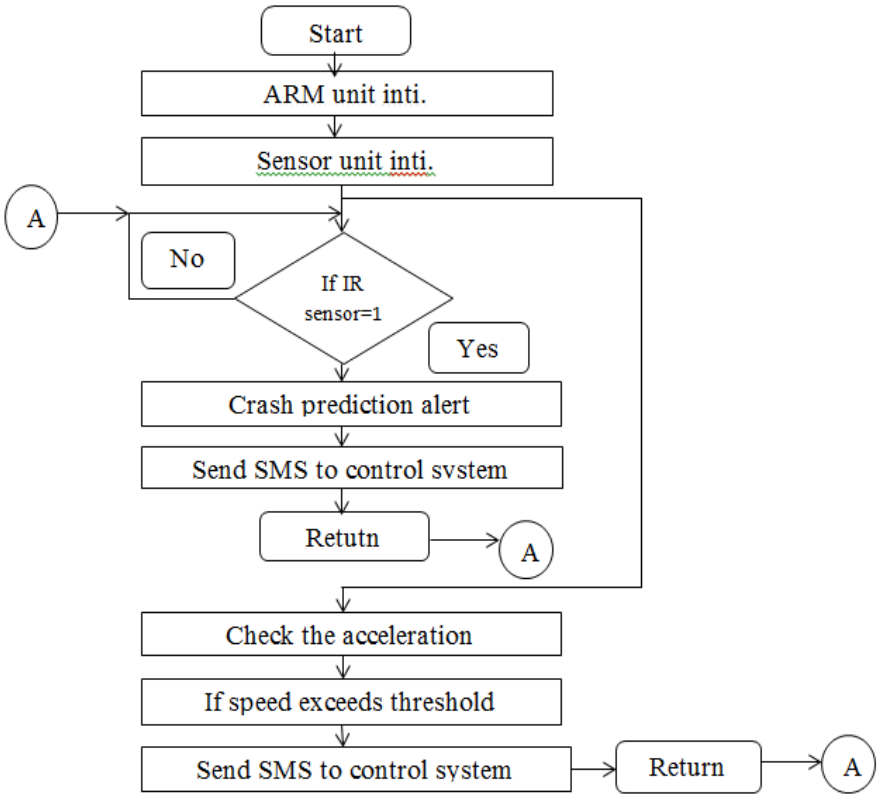

Figure 2. Flow chart

3.3. Working.

The IR sensors are interfaced with any port pin of ARM LPC2148 which gives output for object detection in vehicle front and back side. The accelerometer is used to measure speed of vehicle. The speed of motor is identified by accelerometer and provided to telemetry system. The speed limit can be set by designer so that driver cannot go beyond the given speed limit. If it is exceed the speed limit we can get SMS alert to control centre. The system can also give reply via display and buzzer. The object detection can be used to measure if any other object is coming very close to vehicle which can cause accidental situation. Here proposed system has data acquisition system provided to control centre. The control centre will have another GSM module to receive data from vehicle ARM unit. This received SMS we can read by the help of VB software. This also save telemetry data in control centre PC provided by vehicle ARM unit.

IV. CONCLUSION

To take immediate action when an accident occurs by alerting the respective people by sending message. Applicable for tours & travels company for monitoring purpose.

Here proposed system will give alert signal for over speed of the vehicle to the driver. It also indicates for accidental condition which can help to get necessary action on field.

REFERENCES

[1] Saber Taghvaeeyan and Rajesh Rajamani, Two-Dimensional Sensor System for Automotive Crash Prediction IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS,VOL. 15, NO. 1,FEBRUARY 2014, 1524-9050 © 2013 IEEE

[2] Jayesh Ramesh Chandiramani, Sanjam Bhandari, Hariprasad S.A.,Vehicle Data Acquisition and Telemetry(978-0-7695-5100-5/13 $31.00 © 2013 IEEE)

[3] P.Durgasaranya, K.Venkatesh, Imminent Collision Detection For Automotives Using Sensor System