

Driver Gaze Tracking and Eyes off the Road Detection System



Rubeena

**B.E, M.Tech
 (Embedded System),
 Joginpally B.R Engineering College.**



Shri.Srinivas, B.E, M.Tech, (Ph.D)

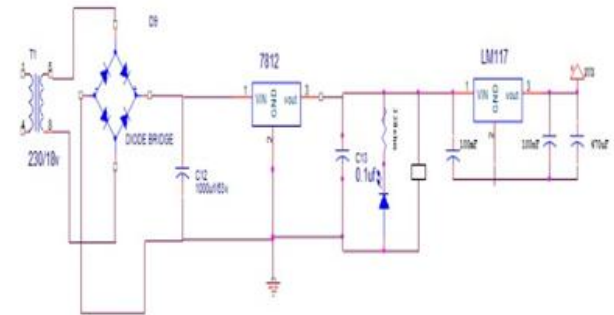
**HOD,
 Department of ECE,
 Joginpally B.R Engineering College.**

ABSTRACT:

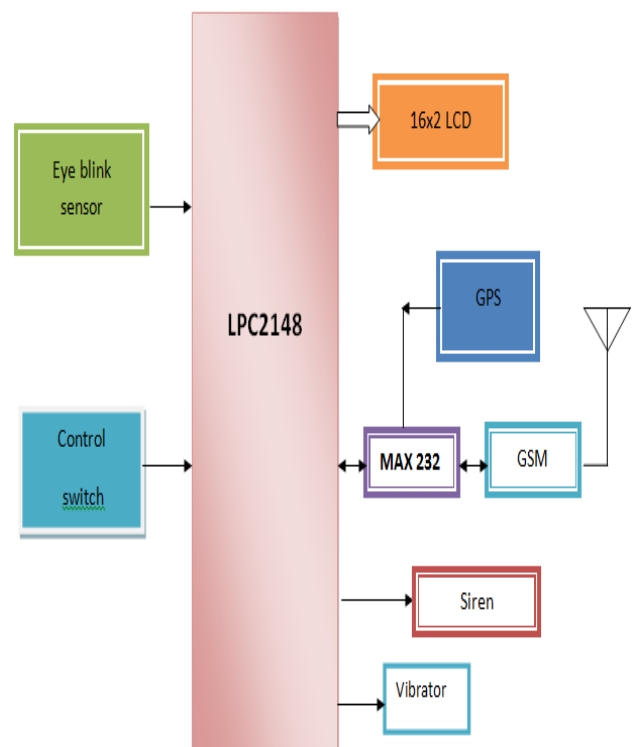
Company's business processes may require the service for 24 hours a day. However, this could cause some problems. For example, in Situbondo, a worker lost his hand because of drowsiness while working in a wood cutting machine. A young even lost his life because working in a sleepy condition. Car driving is very prone to accident due to drowsiness. According to Directorate General of Land Transportation, Department of Transportation, accident that occurred in Indonesia is 93.52% caused by drowsiness.

The project is built around MCU. Here we are using eye blink sensor. By default the vehicle will be in running condition. During this time if the person closes the eyes automatically the vehicle will be in halt condition, the updated message will be displayed on the 16x2 LCD. The Position will be messaged using GPS and GSM respectively interfaced to the controller.

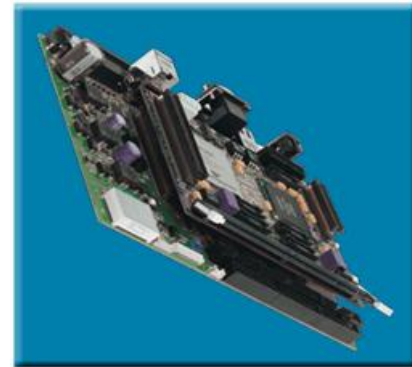
A vibrator is also interfaced so that the driver will be alerted and can drive safely. This project uses regulated 5V, 500mA power supply. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac output of secondary of 230/12V step down transformer.



Block Diagram:



The LPC2148 are based on a 16/32 bit ARM7TDMI-S™ CPU with real-time emulation and embedded trace support, together with 128/512 kilobytes of embedded high speed flash memory. A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at maximum clock rate. For critical code size applications, the alternative 16-bit Thumb Mode reduces code by more than 30% with minimal performance penalty. With their compact 64 pin package, low power consumption, various 32-bit timers, 4- channel 10-bit ADC, USB PORT,PWM channels and 46 GPIO lines with up to 9 external interrupt pins these microcontrollers are particularly suitable for industrial control, medical systems, access control and point-of-sale. With a wide range of serial communications interfaces, they are also very well suited for communication gateways, protocol converters and embedded soft modems as well as many other general-purpose applications.

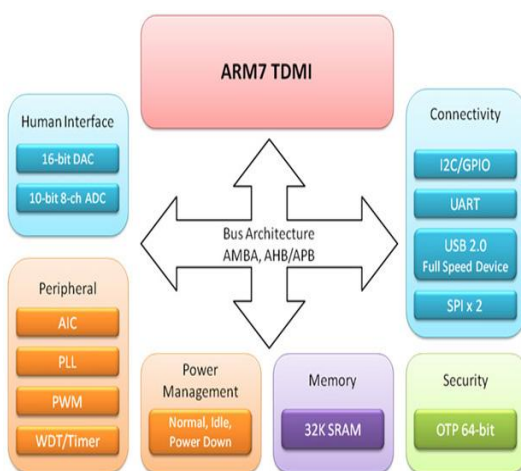


ARM7 board

Global System for Mobile Communication (GSM)

Definition:

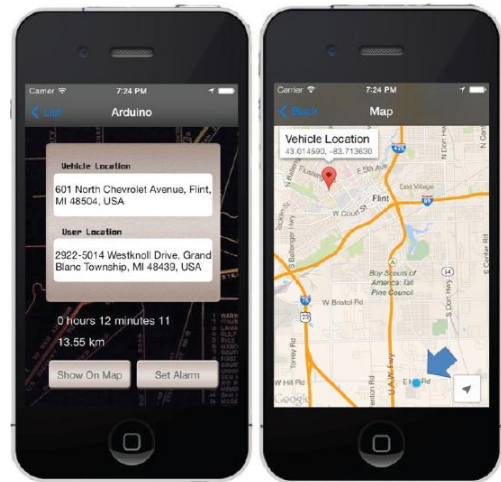
GSM, which stands for Global System for Mobile communications, reigns (important) as the world’s most widely used cell phone technology. Cell phones use a cell phone service carrier’s GSM network by searching for cell phone towers in the nearby area. Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication.



Architecture

ARM PROCESSOR:





Eye Blink sensor

This sensor is IR based. The Variation Across the eye will vary as per eye blink. If the eye is closed means the output is high otherwise output is low. This to know the eye is closing or opening position. This output is give to logic circuit to indicate the alarm. This can be used for project involves controlling accident due to unconscious through Eye blink.



SOFTWARE USED

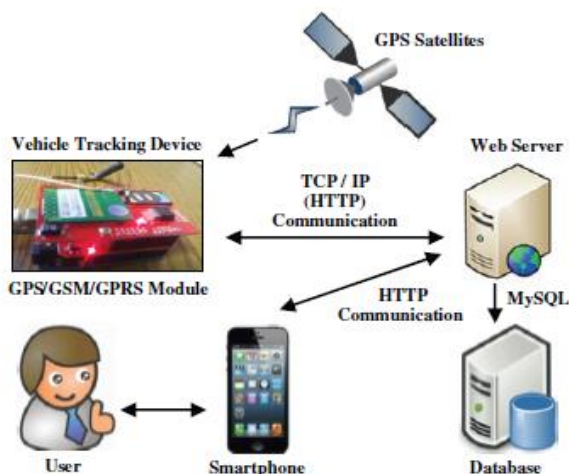
- Keil Compiler
- Embedded C

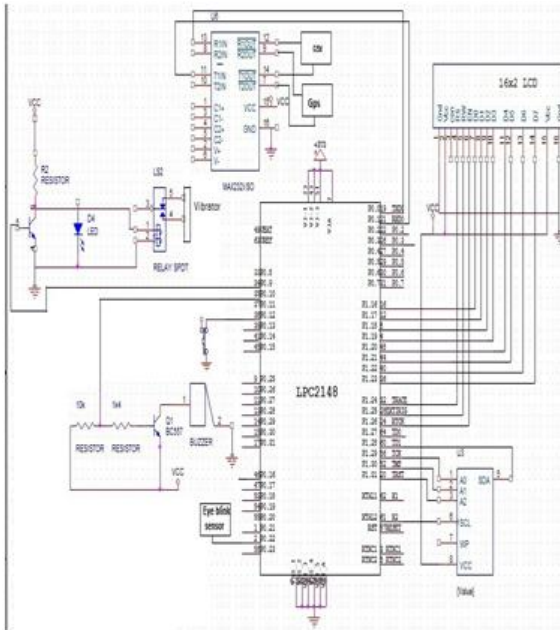
Interfacing diagram

Basic concept of GPS

A GPS receiver calculates its position by precisely timing the signals sent by the GPS satellites high above the Earth. Each satellite continually transmits messages which include

- the time the message was transmitted
- precise orbital information (the ephemeris)
- The general system health and rough orbits of all GPS satellites (the almanac).





Advantages

- Accidents can be prevented
- Drivers will be alerted.
- Driver will be safe
- Fit and forget system
- Highly reliable

Applications

- In cars or any vehicle
- Transportation departments

Future Scope:

Alcohol Sensor can also be interfaced to find the driver is Alcoholic or not.
 For the resemblance of vehicle, a DC motor also can be interfaced, such that if driver is distracted with the Sleep or alcohol, DC motor will go to stop condition.

Conclusion:

This is the best way to avoid accidents and also to save the life of people.

REFERENCES

[1] S. G. Klauer, T. A. Dingus, V. L. Neale, J. D. Sudweeks, and D. J. Ramsey, “The impact of driver

inattention on near-crash/crash risk: An analysis using the 100-car naturalistic driving study data,” Tech. Rep., 2006.

[2] J. F. Coughlin, B. Reimer, and B. Mehler, “Monitoring, managing, and motivating driver safety and well-being.” IEEE Pervasive Computing, vol. 10, no. 3, 2011.

[3] T. Yoshioka, S. Nakashima, J. Odagiri, H. Tomimori, and T. Fukui, “Pupil detection in the presence of specular reflection,” in Proceedings of the Symposium on Eye Tracking Research and Applications. ACM, 2014, pp. 363–364.

[4] L. Swirski, A. Bulling, and N. Dodgson, “Robust real-time pupil tracking ´ in highly off-axis images,” in Proceedings of the Symposium on Eye Tracking Research and Applications. ACM, 2012, pp. 173–176.

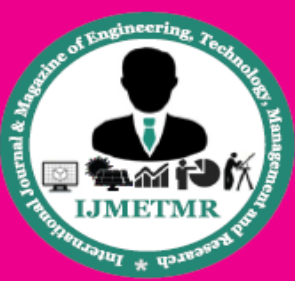
[5] M. Muoz, J. Lee, B. Reimer, B. Mehler, and T. Victor, “Analysis of drivers’ head and eye movement correspondence: Predicting drivers’ glance location using head rotation data,” in Proceedings of the 8th International Driving Symposium on Human Factors in Driver Assessment, Training, and Vehicle Design, Snowbird, UT, 2015, to Appear.

[6] W. J. Talamonti, W. Huang, L. Tijerina, and D. Kochhar, “Eye glance and head turn correspondence during secondary task performance in simulator driving,” in Proceedings of the Human Factors and Ergonomics Society Annual Meeting, vol. 57, no. 1. SAGE Publications, 2013, pp. 1968–1972.

[7] V. Kazemi and J. Sullivan, “One millisecond face alignment with an ensemble of regression trees,” in Computer Vision and Pattern Recognition (CVPR), 2014 IEEE Conference on. IEEE, 2014, pp. 1867–1874.

[8] E. Murphy-Chutorian and M. M. Trivedi, “Head pose estimation in computer vision: A survey,” Pattern Analysis and Machine Intelligence, IEEE Transactions on, vol. 31, no. 4, pp. 607–626, 2009.

Author’s Details:



Maddu Srinivasa Rao Assoc. Prof. M. Srinivasa Rao has obtained Master Degree in Electronics and Communication Engineering specialization in Computers and Communications from JNTU Kakinada Andhra Pradesh and BE degree in Electronics and Communication Engineering from Sri Ramanand Theerth Maratwada University , Nanded, Maharastra. He is pursuing his Ph.D in JNTUH. His research area is in Computer Networks and Communications. He was ratified as Associate Professor by Jawaharlal Nehru Technological University, Hyderabad, Telangana. He is presently working as Associate Professor & HOD in the Department of ECE in Joginpally B.R. Engineering College, Moinabad, Hyderabad and has an experience of 17 years both in Industry & Teaching.

Rubeena Rubeena has obtained Master Degree in Electronics and Communication Engineering specialization in Embedded System from JBREC, Moinabad, Hyderabad, Telangana and BE degree in Electronics and Communication Engineering from DR.V.R.K Engineer College, Aziz Nagar, Hyderabad, Telanagna. She is Topper in the batch with good skills and self confidence to handle any situations.