NOVATEUR PUBLICATIONS
International Journal Of Research Publications In Engineering And Technology [IJRPET]
ISSN: 2454-7875
VOLUME 3, ISSUE 3, Mar. -2017

APPLICATION OF BUZZER & VIBRATION SENSOR FOR VEHICLE TRACKING SYSTEM INVOLVED DROWSINESS DETECTION

TEJASHREE WANI
M.E Student. Electronics and Telecommunication department, Deogiri Institute of Engineering and Management Studies, Aurangabad (MS), India

ABSTRACT:

In the present era of computerization and robotics, the industries are very serious about the efficiency of processes and minimizing the losses. The competition in the business leads to make sturdy decisions concerning the process control. Several times it was observed that, during the repeated and continuous operations, workers have faced severe accidents due to sleepiness. In India around 400 deaths in road accidents occurs every day, significant amount of which is due to sleep. In most of the night transports the sleep of the driver is one of the severe causes for accidents. Authors are trying to provide the solution to this problem. In the implemented model the smart system for observing the human awaken condition is proposed. A system designed with display, GPS, GSM, vibrator, regulator and rectifier to act as support system to save human life.

KEYWORDS: Driver monitoring system, eyes off road detection, gaze estimation, GPS, GSM.

I. INTRODUCTION:

Around 1.5 lakhs people in India are losing death in road accident occurs every year in India. Significant number of which is due to human error. Many accidents have been occurred due to the sleep of drivers. About 30% of the road accidents are caused by the fatigue of the driver. At present, there are various sleepiness recognition systems existing which are implemented using the various implementation techniques i.e. pattern, motion, or shape identification. Consequently, the accuracy of such systems has been found to be low. The system is built around MCU. Here we are using eye blink sensor. Dangerous behaviours are wide-spread among drivers, 54% of motor vehicle drivers in the United States usually carrying a cell when they drive.

A distracted driving recognition system is developed upon reliable EOR judgment, see Fig. 1. However, building a real time EOR detection system for real driving scenarios is very challenging for several reasons: (1) The system could work (24*7) beneath real illumination circumstances; (2) changes in drivers' head position and eye actions result in changes of facial features to be reorganization; (3) the scheme should be precise for various genders, and age ranges. Moreover, it has to be robust to people with different types of glasses. To address these issues, this paper presents a low-cost, accurate, and real-time system to detect EOR. EOR recognition is only one part of a system for detecting and alerting distracted drivers. Fig. 2 illustrates the main components of our system. The scheme collects video from a camera installed on the steering wheel column and tracks facial features, see Fig. 1. Using a 3D head model, the system estimates the head pose and gaze direction. Using 3D geometric analysis, our system introduces a reliable method for EOR estimation. Our system works at 25 FPS in MATLAB and does not require any specific driver dependent calibration or manual initialization. It supports glasses (including sunglasses) and operates during the day and night. In addition, the head pose estimation algorithm uses a 3D deformable head model that is able to handle driver facial expressions (i.e., yawning and talking), allowing reliable head pose estimation by decoupling rigid and non-rigid facial motion. Experiments in a real car environment show the effectiveness of our system.

Figure 1: Eyes off the road (EOR) detection system.

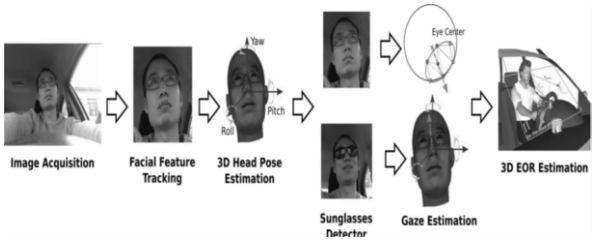


Figure 2: Overview of the eyes off the road (EOR) detection algorithm.

NECESSITY:

Naturalistic driving studies have shown that a driver's allocation of visual attention away from the road is a critical indicator of accident risk. This suggests a real-time judgment of driver's gaze could be coupled with an alerting system.

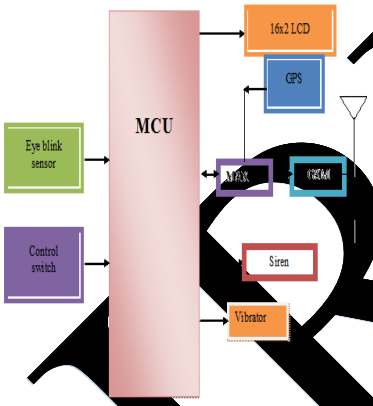
RELATED WORK:

COMPARISON BETWEEN EXISTING SYSTEMS:

Table 1: Comparison Between Different Existing systems

Paper	Name of paper	Author	Research gap
IEEE[2011]	Head pose estimation for driver assistance systems: A robust algorithm and experimental evaluation	S.J.Lee etal	Work on algorithm for yaw and pitch estimation.
IEEE-[2009]	Head pose estimation in computer vision: A survey	E Murphy Chutorian	Work on driver head pose estimation algorithm
IEEE [2014]	Passive driver gaze tracking with active appearance models	S.Baker	Work on passive driver gaze tracking system using AAM
IEEE[2013]	Determining driver visual attention with one camera	P.Smith	Work on motion and color statistics, to track head and facial features
IEEE[2011]	Real time visual cues extraction for monitoring driver vigilance	Ji and Yang	Work on driver monitoring using eye, gaze and head pose tracking
IEEE[2015]	A real-time driver visual attention monitoring system," in Pattern Recognition and Image Analysis	Batista	Work on accurate gaze estimation using ellipse fitting for the face estimation

SYSTEM DEVELOPMENT:



ure 3: Proposed Sy a Overview

The ct is built around U. Here we are using eye blink senso e Position will be messaged using GPS and GSM respectiv terfaced e controller.

DEVELOPED HARDWA

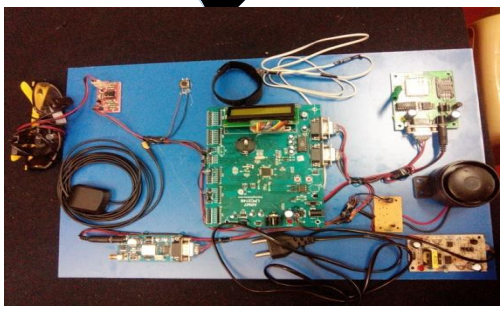


Figure 4.6: Project showing rotation of solar panel in east direction

CONCLUSION:

The system achieved accuracy above 90 % for all of the scenarios evaluated, including night time operation. In addition, the false alarm rate in the on-the- road area is below 5 %. Our experiments showed that our head pose estimation algorithm is robust to extreme facial deformations. While our system provided encouraging results, we expect that improving the facial feature detection in challenging situations (e.g., profile faces, faces with glasses with thick frames) will boost the performance of our system. Currently, we are also working on improving the pupil detection using Hough transform-based techniques to further i e the gaze estimation.

REFERENCES:

1) C. Ahlstrom, K. Kircher, and A. Kircher, "*A gaze-based driver distraction warning system and its effect on visual behavior,*" IEEE Trans. Intell. Transp. Syst., vol. 14, no. 2, pp. 965–973, Jun. 2011`
2) Nabo, *"Driver attention—Dealing with drowsiness and distraction,"* Smart Eye, Gothenburg, Sweden, Tech. Rep., 2009.
3) J. P. ista, *"A real-time driver visual attention monitoring system,"* in Pattern Recognition and Image Analysis, vol. , Berlin, Germany: Springer-Verlag, 2005, pp. 200–208..
4) G. M. Fitch et al., "*The impact of hand-held and hands-free cell phone use on driving performance and safety-critical event risk,"* Nat. Highway Traffic Safety Admin., ashington, DC, USA, Tech. Rep. DOT HS 811 757, 2013.
5) L. M. Bergasa, J. Nuevo, M. A. Sotelo, R. Barea, and M. E. Lopez, "*Real time system for monitoring driver vigilance,"* IEEE Trans. Intell. Transp.Syst., vol. 7, no. 1, pp. 63–77, Mar. 2006.
6) C. Cao, Y. Weng, S. Zhou, Y. Tong, and K. Zhou, *"Face warehouse: A 3D facial expression database for visual computing,"* IEEE Trans. Vis. Comput. Graphics, vol. 20, no. 3, pp. 413–425, Mar. 2014.
7) Q. Ji and X. Yang, "Real time visual cues extraction for monitoring driver vigilance," in Computer Vision Systems, Berlin, Germany: Springer-Verlag, 2001, pp. 107–124..
8) Q. Ji and X. Yang, "*Real-time eye, gaze, and face pose tracking for monitoring driver vigilance*," Real-Time Imag., vol. 8, no. 5, pp. 357–377,Oct. 2002.
9) S. J. Lee, J. Jo, H. G. Jung, K. R. Park, and J. Kim, "*Real-time gaze estimator based on driver's head orientation for forward collision warning system*," IEEE Trans. Intell. Transp. Syst., vol. 12, no. 1, pp. 254–267,Mar. 2011.

10) D. Lowe, "*Distinctive image features from scale-invariant key points*," Int.J. Comput. Vis., vol. 60, no. 2, pp. 91–110, Nov. 2004.
11) C. Morimoto, D. Koons, A. Amir, and M. Flickner, "*Pupil detection and tracking using multiple light sources*," Image Vis. Comput., vol. 18, no. 4, pp. 331–335, Mar. 2000.
12) E. Murphy-Chutorian, A. Doshi, and M. M. Trivedi, "*Head pose estimation for driver assistance systems: A robust algorithm and experimental evaluation,"* in Proc. IEEE Intell. Transp. Syst. Conf., 2007,pp. 709–714.
13) J. M.eshikhawa, S. Lucey, and J. F. Cohn, "*Deformable model fitting by regularized landmark mean-shift,"* Int. J. Comput. Vis., vol. 91, no. 2, pp. 200–215, Jan. 2011.
14) P. Smith, M. Shah, and N. da Vitoria Lobo, "*Determining driver visual attention with one camera,"* IEEE Trans. Intell. Transp. Syst., vol. 4,no. 4, pp. 205–218, Dec. 2003.
15) J. Sung, T. Kanade, and D. Kim, "*Pose robust face tracking by combining active appearance models and cylinder head models,*" Int. J. Comput. Vis., vol. 80, no. 2, pp. 260–274, Nov. 2008.