Impact Factor (SJIF): 4.542

International Journal of Advance Research in Engineering, Science & Technology

e-ISSN: 2393-9877, p-ISSN: 2394-2444

Volume 4, Issue 5, May-2017

Driver Drowsiness Detection using Representation Learning and Efficient Alarming System

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Abstract *— Computing technology has provided assistance to drivers mainly in the form of intelligent vehicle systems.. Thus, driver drowsiness detection has been considered a major huge number of sleep induced road accidents. Driver fatigue is a significant factor in a large number of vehicle accidents The main aim of the project is to develop Drowsy Driver Detection System that allows for warning the driver of drowsiness or in attention to prevent traffic accidents. We propose a vision based intelligent algorithm to detect driver drowsiness. Previous approaches are generally based on blink eye, eye close rate, eye brow shape and other hand engineered facial expressions. Our system proposes an algorithm for driver drowsiness detection using representation learning* and Efficient Alarming System. *A The proposed algorithm makes use of features learnt using neural network so as to explicitly capture various latent facial features and the complex non-linear feature interactions. A softmax layer is used to classify the driver as drowsyness or non-drowsyness. This system is hence used for warning the driver of drowsiness or in attention to prevent traffic accidents. We present both qualitative and quantitative result.*

Keywords:— *Eye Segmentation, Drowsiness Detection,Alarming system,Representation Learning, Facial Features.*

INTRODUCTION

One of them is drowsiness detection system. Driver fatigue is a huge traffic safety problem and is widely believed to be one of the largest contributors to fatalities and severe injuries in traffic today, either as a direct cause of falling asleep at the wheel or as a contributing factor in lowering the attention and reaction time of a driver in critical situations .

There has been a very large increase in road accident due to drowsiness of driver while driving which leads to enormous fatal accidents. The driver lose his control when he falls sleep which leads to accident .This is because when the driver is not able to control his vehicle at very high speed on the road.Accidents with commercial heavy vehicles are not dangerous but also very costly and the counteraction of driver fatigue is highly important for improvement of road safety. Drowsiness is something that happened frequently. We can feel sleepy either when we do an activity or not. However, we must pay attention for that. Feeling sleepy when we are in certain condition can be dangerous and can bring great suffer to many people, for example when we are driving. A lot of factors can cause people to feel sleepy such as lack of rest, driving a car at night, long distance driving, or there is no partner who can accompany the driver which lead him/her to become bored and sleepy. The general solution for this problem is to ask someone to accompany us while driving to prevent drowsiness. However this solution can't be done every day because sometimes the driver must drive alone. Many research about drowsiness detection system have utilized artificial intelligence, but they were not implemented on mobile devices. The software is based on Android application in order to be implemented in real condition, so we can reach the purpose of this research. Finally, a warning strategy in terms of vibrations in the steering wheel has been investigated.

LITURATURE SURVEY

[1]*:* Arpit Agarwal, "Driver Drowsiness Detection System",portfolio of projects on human computer interaction, Dec,2010.

Autonomous systems designed to analyze driver exhaustion and detect driver drowsiness can be an integral part of the future intelligent vehicle so as to prevent accidents caused by sleep. A variety of techniques have been employed for vehicle driver fatigue and exhaustion detection. Driver operation and vehicle behaviour can be implemented by monitoring the steering wheel movement, accelerator or brake patterns, vehicle speed, lateral acceleration, and lateral displacement.

2]*:* Karlsson, A-S., Sderman "Design of fatigue risk management lsning, Drowsy Driver deliverable D1.6, 2011

They propose new techniques are based on machine learning algorithms to detect driver drowsiness levels. Authors creates Automatic classifiers for 30 facial actions from the Facial Action Coding system using machine learning on a separate database of spontaneous expressions to finally catego- rize driver drowsiness. Authors proposes a system that applies automated measurement of the face during actual drowsiness to discover new signals of drowsiness in facial expression.

[3]:Sandberg, D, , "Detecting Driver Sleepiness, Doctors Dissertation Thesis", Chalmers University of Technology, ISSN 0346-718X; nr 0346, 2012.
Describes current research towards new approaches for storytelling and context-and location specific character development. The result of this research is the Million Story Building (MSB) project, which has been designed and implemented by the Mobile and Environmental Media Lab in USCs Interactive Media Division. The new School of Cinematic Arts building provides the setting for ambient storytelling in which conversations between the building and its inhabitants introduce new ways of interacting with architectural spaces for storytelling

[4]: Sandberg, D., Wahde, M, "Analysis and optimization of blink behavior based indicators for the detection of driver sleepiness" FFI Drowsy Driver internal document 2013-05-28.
They proposed Driver operation and vehicle behaviour can be implemented by monitoring the steering wheelmovement, accelerator or brake patterns, vehicle speed, lateral acceleration, and lateraldisplacement. These are non-intrusive ways of driver drowsiness detection, but are limited to the type of vehicle and driver conditions.

[5]: Anund, A, "Evaluation of specific vibrations in steering wheel (Vibsec) as a countermeasure for driver falling asleep - a simulator experiment",FFI Drowsy Driver internal document 2014.
They proposed for nonintrusive, real-time detection of driver sleep states with the help of various visual cues and observed facial features. An observed pattern of movement of eyes, head and changes in facial expressions are known to reflect the persons fatigue and vigilance levels. Eye closure, head movement, jaw drop, eyebrow shape and eyelid movement are examples of some features typical of high fatigue and drowsy state of a person.

OBJECTIVES

1. Attention to prevent traffic accidents.
2. A driver detection system for supporting and warning the driver when becoming drowsy.
3. Provide security for safe driving on road.

PRUPOSED SYSTEM:

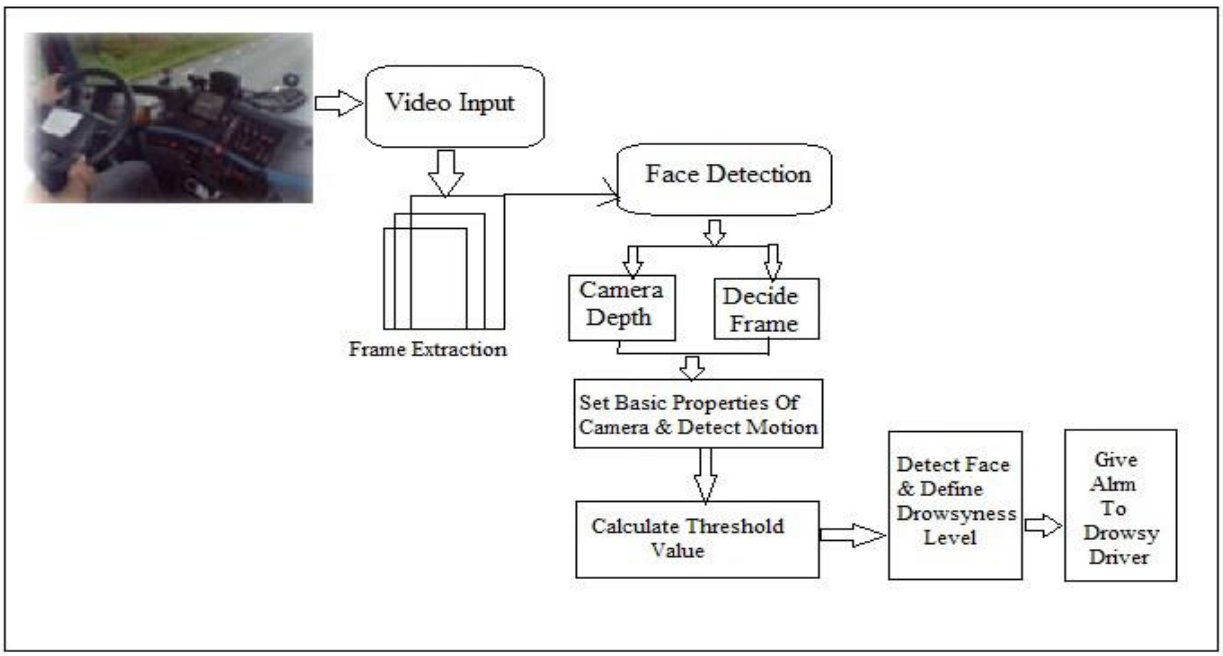

Fig.System Architecture

We prupose the real-time system includes a few more functions when monitoring the driver, in order to make the system more robust. There is an initialization stage, in which the for the first 4 frames, the drivers eyes are assumed to be open, and the distance between the y coordinates of where the intensity changes occur, is set as a reference.
After the initialization stage, the distances calculated are compared with the one found in the initialization stage. If the lower distance is found (difference between 5-80 pixels), then the eye is determined as being closed. Another addition to the realtime system is a comparison of the left and right eyes found. The left and right eyes are found separately, and their positions are compared. Assuming that the drivers head is not at an angle (tilted), the y coordinates of the left and right eye should be approximately the same. If they are not, the system determines that the eyes have not been found, and outputs a message indicating that the system is not monitoring the eyes. The system then continues to try to find the eyes. This addition is also useful in cases where the driver is out of the cameras sight. In this case, the system should indicate that no drowsiness monitoring is taking place.

Face Detection Algorithm: This algorithm is used face detection function takes one frame at a time from the frames provided by the frame grabber, and in each and every frame it tries to detect the face of the automobile driver. This is achieved by making use of a set of pre-defined Haarcascade samples.

APPLICATIONS

Human Safety
Road Transport Safety
Reduce road accident

EXPERIMENTAL RESULTS

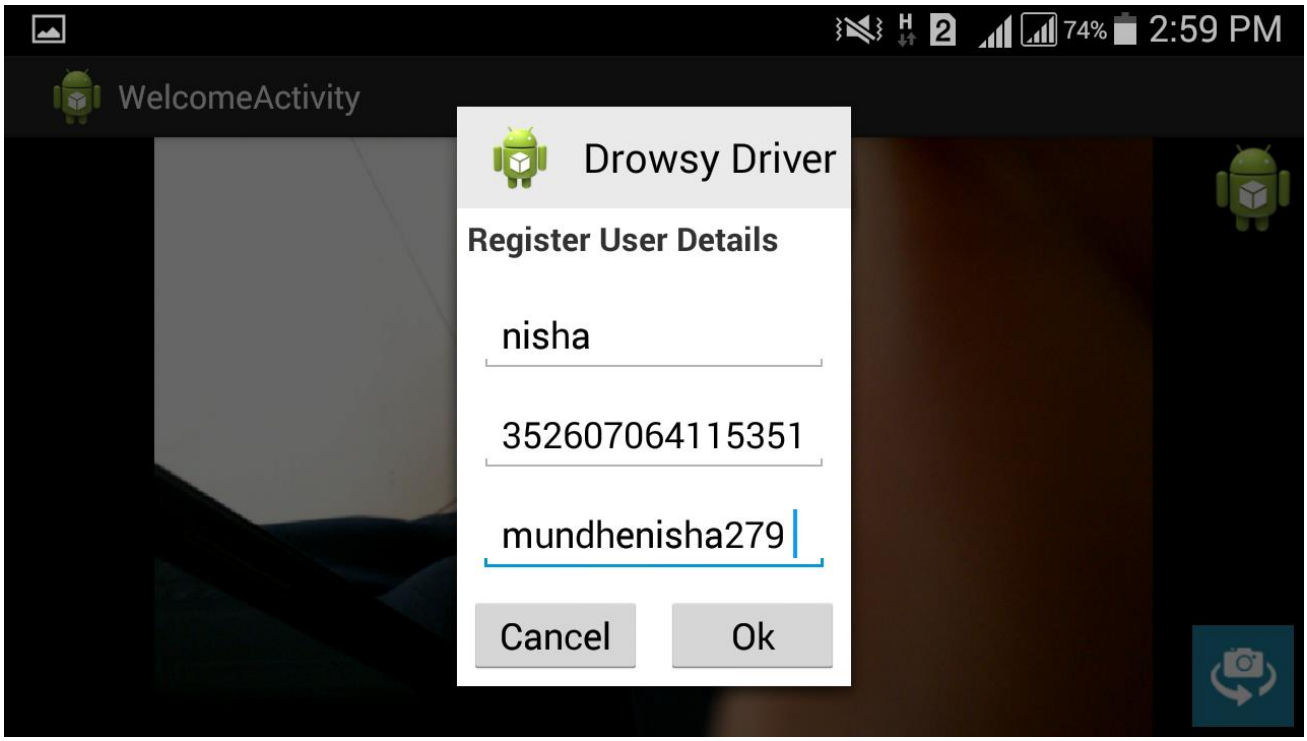

Figure A)Login Page

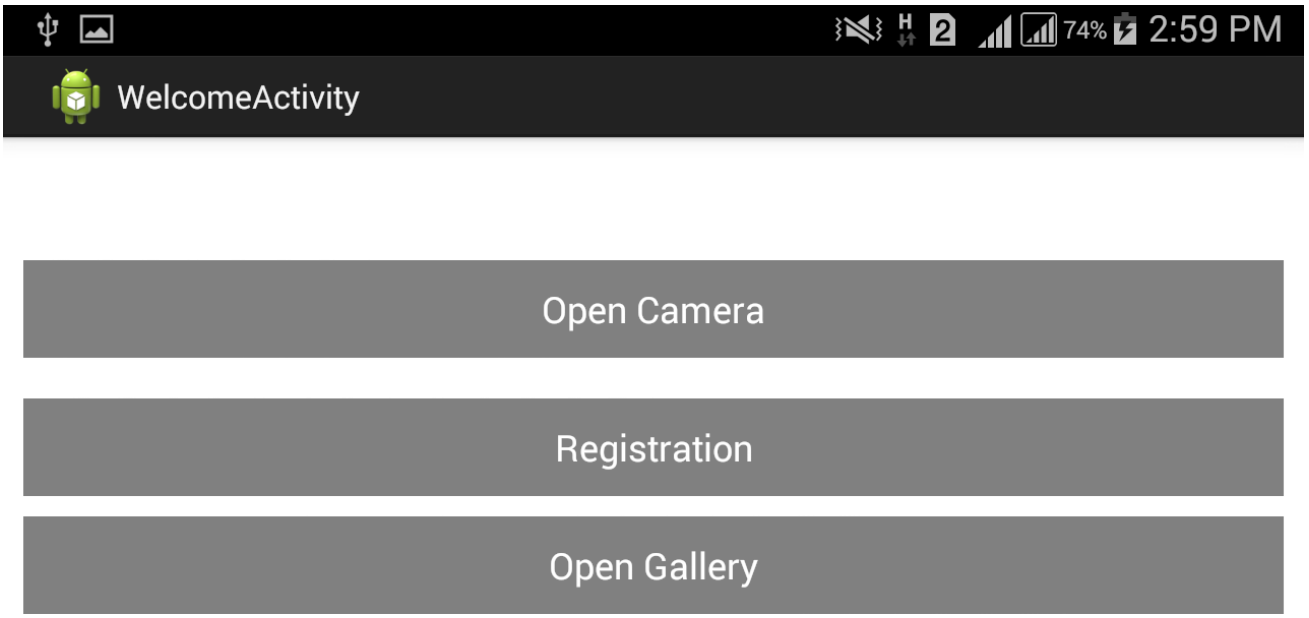

Figure.B)Show Registration and camera for capture input Frame.

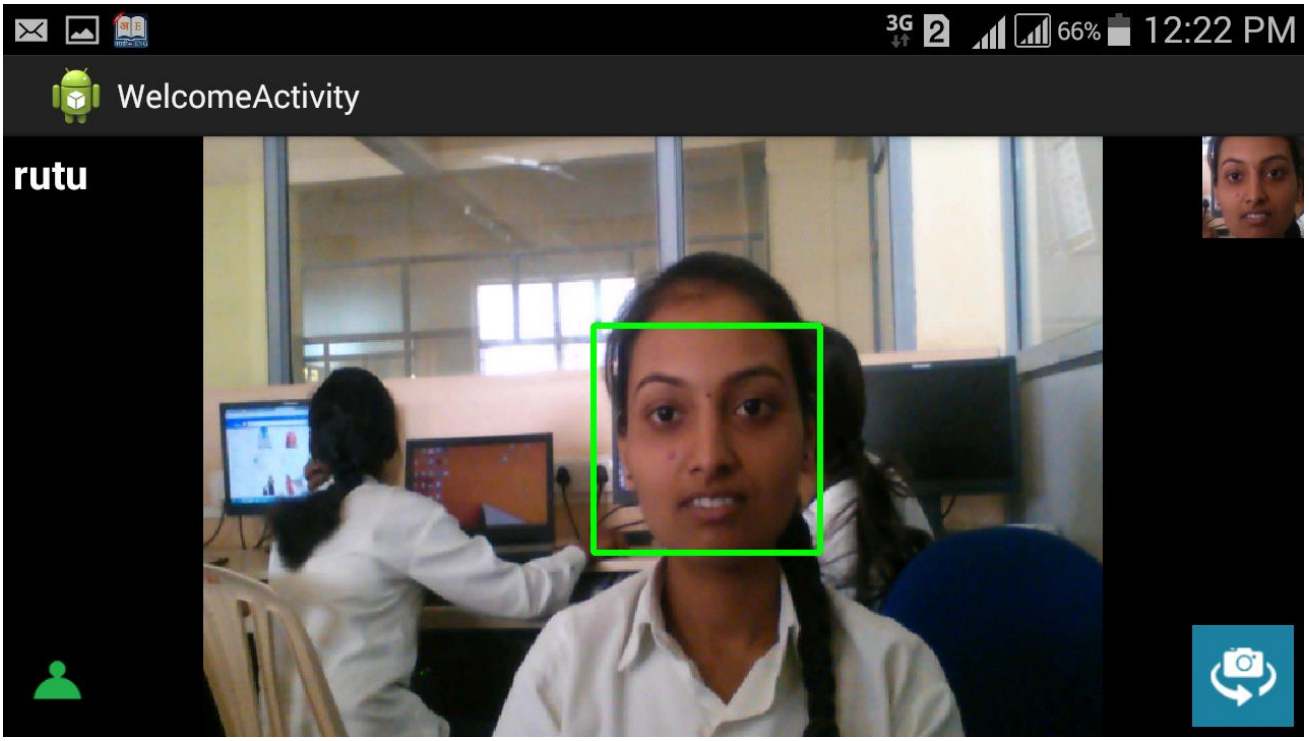

Figure. C)Exact Frame view

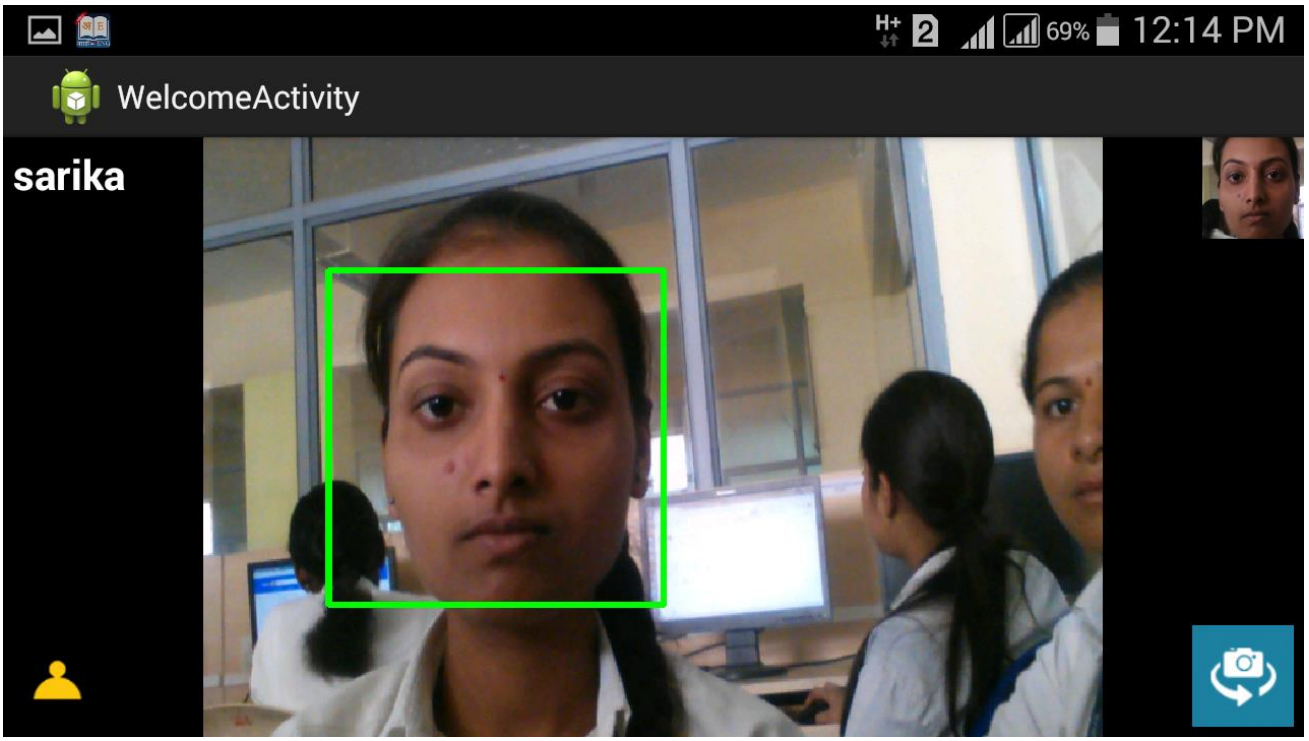

Figure.D) Event Postion

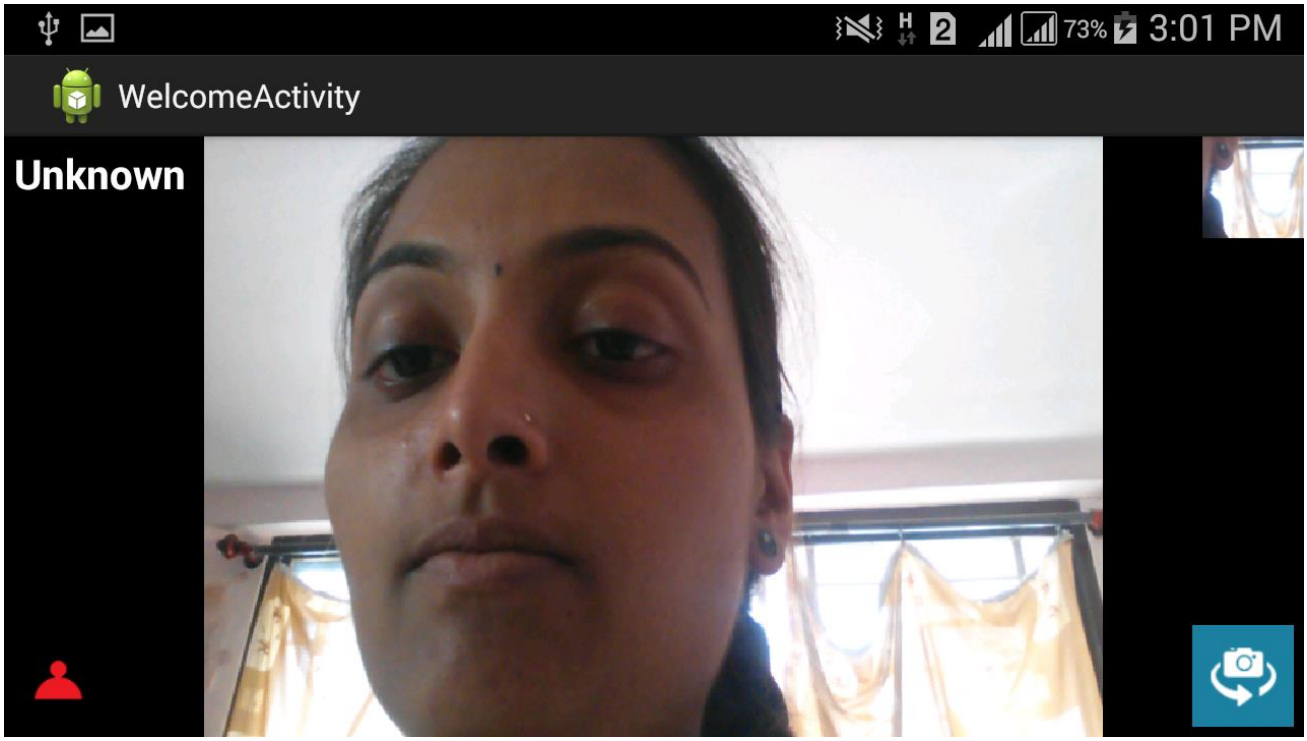

Figure E) Out side Frame or Camera

CONCLUSION

We proposed the analysis and design of driver drowsiness detection and alert system is presented. The proposed system is used to avoid various road accidents caused by drowsy driving. And also this system used for security purpose of a driver toavoiding accident to unconsciousness through camera bychecking eye blink. Here one eye blink sensor is fixed invehicle where if driver lose his consciousness, then it alertsthe driver through buzzer to prevent vehicle from accident.

REFERENCES

[1] Arpit Agarwal, "Driver Drowsiness Detection System" portfolio of projects on human computer interaction, December,2010.

[2] Kecklund, G., Åkerstedt, T., " Recommendation of Fatigue Risk Management (FRM)," FFI Drowsy Driver deliverable D1.3, 2012.

[3] Karlsson, A-S., Söderman, M., Kronberg, P., "Design of fatigue risk management lösning,", FFI Drowsy Driver deliverable D1.6, 2011.

[4] Sardareh, R., Specification and development of scheduling algorithms for managing driver fatigue within road transport, Master Thesis Report and FFI Drowsy Driver deliverable, 2012.

[5] Karlsson, A-S., Söderman, M., "Behovs- och kravanalys av back-office och driver coaching koncept," FFI Drowsy Driver deliverable D1.4, 2010.

[6] Trafikverket, "Driver Alert - Aspekter på introducering av ett trötthetsvarningssystem", FFI Drowsy Driver internal document, 2012.

[7] Grante, C., Kronberg, P., Stamlin, R.," Drowsy business – potential service offers with Customer Desirability, Technological and Organizational Feasibility, and Business Viability qualities," FFI Drowsy Driver internal document 2012.

[8] Sandberg, D., Wahde, M., "Analysis and optimization of blink Chalmers University of Technology, FFI Drowsy Driver internal document 2012-05-28.

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