

DRIVER DROWSINESS DETECTION USING VISUAL INFORMATION ON ANDROID DEVICE

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ABSTRACT

Technology plays a central part in our everyday lives. There has been a growth in the Internet of Things (IoT) market in many sectors which has received significant interest from both academia and industry in research. Vision based driver assistance systems (VBDAS) also presume a driver in the ego vehicle (i.e., the vehicle in which the systems); autonomous driving will benefit from VBDAS solutions. The article reviews research topics for VBDAS and provides a detailed bibliography. It starts by describing basic principles and ratings in the field, emphasizing the value of performance assessment for VBDAS solutions as well. The article then discusses briefly the functionalities of protection and comfort (evitating blind spots, night vision, and virtual windshield), before exploring in depth the basic and midlevel awareness of the world. This includes computing distance and motion, knowing ego motion, detecting obstacles, tracking objects (vehicles or pedestrians), and detecting and recognizing key elements of the infrastructure (road, lane, traffic signs, and free space). Also listed are typical VBDAS examples (e.g. driver monitoring and awareness of the driver environment, speed adaptation, queuing, parking, blind spot supervision, lane departure warning, incorrect lane detection, intelligent headlamp control, or inter car communication). The article ends with outlook for autonomous driving and simulation of the road-environment.

1. INTRODUCTION

Drowsy driving is one of the most important factors behind fatal road accidents. One of the latest study shows that one out of five road accidents are caused by drowsy driving, which is approximately about 21 percent of road accidents, and this figure rises every year, based on data from 180 different countries, according to the global road safety status report. This definitely underlines the fact that the overall number of road traffic deaths worldwide is very high due to the drowsiness of the driver. Driver exhaustion, drink and drive and carelessness emerge as major reasons behind these accidents on the lane. Because

of this, many lives and families across various countries are getting affected. Realtime drowsy driving identification is one of the biggest possible significance that can be introduced to help drivers make them aware of drowsy driving conditions. These conductor behavioral state identification system may help identify the driver's drowsy conditions early and can likely prevent mishaps. With this paper we're presenting driver drowsiness identification technique using Free CV, raspberry pi.

2. LITERATURE SURVEY

2.1 EXISTING SYSTEM:

In current we use an eye twitch sensor to detect the person's drowsiness. It looks like regular spectacles with a sensor attached. The sensor emits rays in the infrared. If the sensor detects it is the sign of drowsiness so we can use Buzzer to warn the driver.

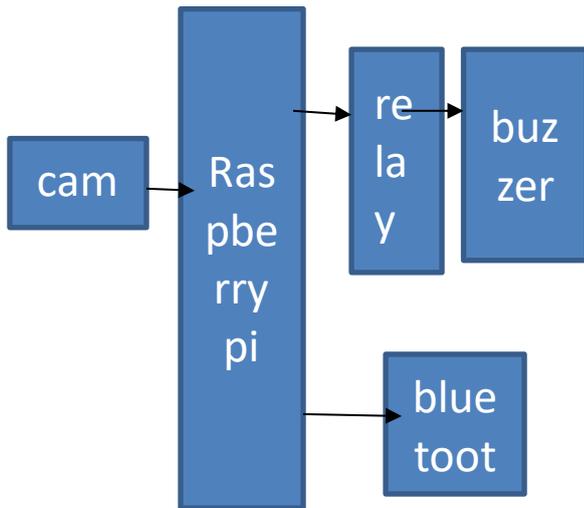
Drawback:

- Long exposure to the IR rays is eye damage.
- People with eye sight can not wear spectacles, since such spectacles do not act as spectacles of vision.
- This sensor is in the center of the spectacles so the driver can have trouble driving.

2.2 PROPOSED SYSTEM:

We are using raspberry pi and Webcam in this project. Web cam will catch the driver's eyes in real time and will send the details to the raspberry pi. Raspberry pi can check whether the driver has opened or closed his eye on the frames sent from the webcam. When the driver closes his eyes, the person becomes drowsy and sends alert message to driver and show it on the Bluetooth application.

Block diagram:



3. SYSTEM REQUIREMENTS

3.1 HARDWARE REQUIREMENTS

3.1.1 Raspberry Pi:

Raspberry Pi is a credit card sized device produced and built by the Raspberry Pi Foundation in the United Kingdom with the aim of teaching basic computer science to school children and everyone else involved in computer hardware, programming, includes an ARM1176JZFS 700 MHz processor, Video Core IVGPU, and was originally shipped with 256 megabytes of RAM, and later upgraded to 512 MB (Model B & Model B+).

It doesn't have a built in hard disk or solid state drive, but it uses a booting SD card and permanent storage, with the Model B+ utilizing a MicroSD.

3.1.2 Raspberry Pi Hardware:

The Raspberry Pi is a device equipped with a credit card that plugs into your television and a keyboard. It is a powerful little computer that can be used in electronics projects as well as for many of the things your desktop PC does, such as spreadsheets, word processing and games. Also, it plays video in high definition.

We want children around the world to learn how computers function, how to navigate the technological environment around them, and how to program. The Raspberry Pi is a low cost, credit cardsized device that attaches to a computer monitor or TV and uses a regular mouse and keyboard.



It is a small capable computer that helps people of all ages to explore programming, and learn how to program in languages such as Scratch and Python. This is capable of doing everything you would expect from a desktop computer to surfing the internet and watching high definition video, creating spreadsheets, word-processing and playing games.

What's more, the Raspberry Pi has the potential to communicate with the outside world, and has been used in a broad variety of digital creator ventures, from music machines and parent detectors to weather stations and tweeting birdhouses with infrared cameras. We want to see children all over the world using the Raspberry Pi to learn how to program and understand how computers function. There are four Raspberry Pi models currently available. They're Model A, Model B, Model B+, and Model Compute. All versions use the same CPU, the BCM2835 but different hardware features.

3.1.3 Relay:

A relay is an electromagnetic switch that is used with a low power signal to turn on and off a circuit, or when several circuits have to be operated by one signal.

The majority of highend industrial application devices have relays for their efficient operation. Relays are basic switches which are both electrically and mechanically operated.

Relays consist of an electromagnet, and contacts as well. The method of switching is applied with the aid of the electromagnet.

Many operating standards are also in place for its operation. But they vary in the way they apply. Most of the tools have relay functionality.



3.1.4 Buzzer:

A Buzzer or beeper is a signaling system, usually electronic, used in cars, household appliances such as microwave ovens. This most typically consists of a variety of switches or sensors connected to a control device that decides when and which button has been pressed or a predetermined time has lapsed, and generally illuminates a light on the correct button or control panel, and sounds a alarm in the form of a constant or sporadic buzzing or beeping sound.

This device was originally based on an electromechanical system that was similar with an electric bell without the metal gong (which makes the ringing noise). These devices were often attached to a wall or ceiling, and the ceiling or wall was used as a sounding board.

Nowadays, the use of a ceramicbased piezoelectric sounder like a Sonalert that produces a highpitched tone is more common. Those were typically hooked up to "runner" circuits which varied the sound pitch or pulsed the sound on and off.



3.1.5 Webcam:

A webcam is a video camera that feeds or streams an image or video to a computer network, such as the Internet, in real time, to or from a computer. Usually, webcams are small cameras that sit on a desk, connect to a user's computer or are built into the hardware. Webcams may be used for conversations that involve live audio and video, during a video chat session between two or more people.

Bluetooth:

Bluetooth is a standard used in short range radio links, intended to replace wired connections between electronic devices such as mobile phones, Personal Digital Assistants(PDA), computers, and many other devices.

3.2 Software Requirements:

3.2.1 Python:

Python is a programming language that is general purpose, dynamic, high level, and interpreted. To build software, it supports Object Oriented programming approach. Learning is quick and fast, and provides plenty of high-level data structures.

Learning yet powerful and flexible scripting language is simple, making it attractive for creation of applications. With its translated nature it is syntax and dynamic typing, making it an ideal language for scripting and fast application development.

It supports various types of programming including styles of object oriented, imperative, and functional or procedural programming. It is not intended to be focused on special areas such as web programming. Therefore it is known as multipurpose because it can be used with network, business, 3D CAD etc.

We don't need to use data types to declare variable because it's dynamically typed and we can write `a=10` to assign an integer value in an integer variable. It allows creation and debugging quick because there's no compilation phase involved in python creation and the edit-test-debug process is quite short.

3.2.2 NOOBS (New Out Of Box Software) :

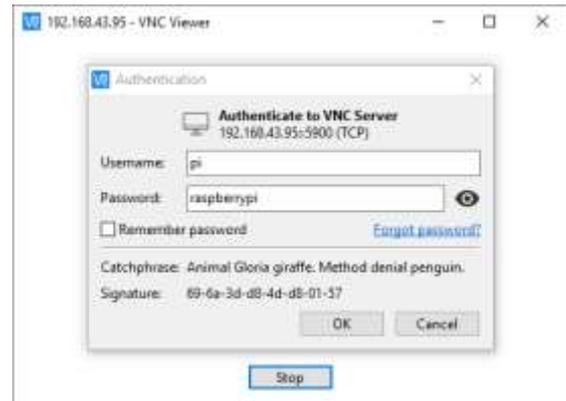
Provided as a free download from the Raspberry Pi website, NOOBS (New Out Of Box Software) is a user interface enabling you to quickly install a variety of Raspberry Pi operating systems. There are two versions available: a bulky offline installer that installs all the available operating systems and a slim line alternative, Lite, which is configured to install network.



RESULTS:



If the installation is complete (see below), NOOBS also includes the means to configure your Pi; previously, opening a text file or in the case of Raspbian in a command line menu might have been what you should have done. Configuration is made even easier for NOOBS.



Work on creating a simple Raspbian computer game, save your data and then boot in

Open ELEC to watch a film before going back to Raspbian to start where you left off.

You should have downloaded the NOOBS installer by now it is better to get started with the Lite version, particularly if space is limited on your chosen SD card.

OUTPUT SCREENS

3.2.3 Android Device:



The android device is connected to the raspberry pi that is connected to the wifi, then we have to pair the mobile device with the Bluetooth device and we have to install a blue serial app in the android device that is paired with the Bluetooth device.

If the driver goes to drowse state then we get an warning message in the android device using the Bluetooth.



ADVANTAGES:

- This approach will form the basis for a program that could theoretically reduce the number of drowsy driving-related accidents.
- Offers driver real-time somnolence feedback.
- Conductor health.
- Data collection system

Conclusion:

Built based on driver's eye closure, the Drowsiness Detection System can distinguish normal eye twitch and somnolence and detect drowsiness while driving. The proposed device is able to avoid the accidents when driving due to sleepiness.

The system works well even when drivers are wearing spectacles, and even when the camera provides poor performance in low light conditions. Information about the location of the head and eyes is obtained through different self developed algorithms for the image processing.

The machine should be able to determine if the eyes are opened or closed during the monitoring. A alert signal is given when eyes are closed for too long.

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