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CENG 408

USER'S MANUAL
REPORT

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Version 1.0

26.05.2023

About This Guide

This document is prepared to help users set up the basic software development environment for using Drowsy Driver Detection System. Therefore, our primary goal is to explain how users can easily set up our environment by providing detailed steps and figures.

Release Notes

Date	Version	Release notes
19.05.2023	V1.0	First release.

1. User Manual

1.1 General Briefing

- This technology is intended to keep you safe while driving by warning you when it senses tiredness. This user manual will explain how to use and maintain the system.
- Software requires an internet connection, but not have any hardware dependencies.

1.2 Software Information

1.2.1 Overall Briefing

Installation:

- Locate your camera to a suitable location for the system, preferably on the dashboard or near the driver's seat.
- Connect the system to a power source your hardware.
- Connect system to our web applications.

Usage:

- Turn on the system by pressing the power button.
- Adjust the sensitivity of the system using the sensitivity button.
- Begin driving. The system will monitor your eyes and facial expressions to detect signs of drowsiness.
- If the system detects signs of drowsiness, it will alert you with a loud alarm.
- Take a break and rest if you receive an alert.

Maintenance:

- Clean the system regularly with a soft cloth to prevent dirt and debris buildup.
- Check the power cable and connection periodically to ensure proper function.
- If the system appears to be malfunctioning or giving false alerts, contact project’s support for assistance.

Safety precautions:

- The system is a tool to assist in keeping the driver alert, but it is not a replacement for

good driving habits and adequate rest.

- Do not rely solely on the system and always remain aware of your surroundings and driving conditions.
- Do not attempt to adjust the system while driving.
- Always follow local traffic laws and regulations.

Functionalities of the components will be explained later in this document.

1.2.2 Getting Started

1.2.2.1 Opening System

Login to the system should be made through the login or register buttons after entering the necessary information into the system. After that, the system will automatically resume operations.

1.2.3 Operational Functionality

1.2.3.1 Classification and Detection Process

In fact, the driver does not need to perform an operation a second time to operate these systems. He just needs to run the system and log in to the system. After logging in, the driver will be automatically redirected to these systems.

***Addendum:**

1. If there are no connection between camera and driver, system will generate an error message in result display area indicating the process requires a real-time to operate.

1.2.3.2 Drowsy Driver Detection

After registering or logging into the system, the system will automatically redirect the driver to the part where the real-time video was received. At this time, the video will start to be received instantly, it will be divided into frames in the background. After the frames are created, the machine learning model contained in the system will be applied to each frame separately, and calculations will be made according to the obtained labels. According to these calculations, it will be determined whether the driver is drowsy or not, or even if there is no fatigue groove. Accordingly, the system error will give a message and activate the alarm.

***Addendum:**

2. If there are no connection between camera and driver, system will generate an error message in result display area indicating the process requires a real-time to operate.

1.2.3.3 System Overview

- The software is based on the Windows 8, 10 or variants.
- Performance is hardware dependent.
  - Higher CPU speed or higher RAM capacity the better.
- Operational Status:
  - Under development.

1.3 Compilation / Installation Guide

1.3.1 Prerequisites / Tools

- Visual Studio Enterprise 2019 or higher should be installed on computer to compile and run the project.
- Final version of the project is available at the link. It can be downloaded as a .zip file. Extract the files from .zip folder.
- Open the solution file to execute.
- If there is a problem with library, you need to specify according to requirement.txt and upload all libraries which are essential. For example, you can find these libraries below, and you can download like in Figure-1:
  - Flask==1.4.0
  - pymongo==3.12.0
  - dlib==19.22.0
  - Keras==1.1.2
  - tensorflow==2.8.0
  - numpy==1.22.3
  - opencv-python==4.6.0.66
  - Pillow==8.4.0
  - winsound==0.1.9;

```
#!/bin/bash

# Flask
pip install Flask

# MongoDB
# İndirme sayfasına buradan erişebilirsiniz: https://www.mongodb.com/try/dow

# Dlib
# Yükleme talimatları, Dlib web sitesinde mevcuttur. İndirme sayfasına burad

# Keras
pip install Keras

# TensorFlow
pip install tensorflow

# Python
# İndirme sayfasına buradan erişebilirsiniz: https://www.python.org/download

# OpenCV
pip install opencv-python

# datetime (standart kütüphane)
# Kurulması gerekmez

# NumPy
pip install numpy

# PIL
pip install Pillow

# winsound (Windows için)
# Windows işletim sistemiyle birlikte gelir, Python'da kullanmak için ek bir
```

Figure-1 Installation for Required Libraries

1.3.2 Opening the Project in Visual Studio Enterprise

- Open Visual Studio Enterprise.
- When Visual Studio Enterprise is opened, click Open Project and then choose the project folder solution from the downloaded project folder.

After the project is opened in Visual Studio Enterprise, as seen in Figure 1, click login or register button to execute taking real-time and detection.

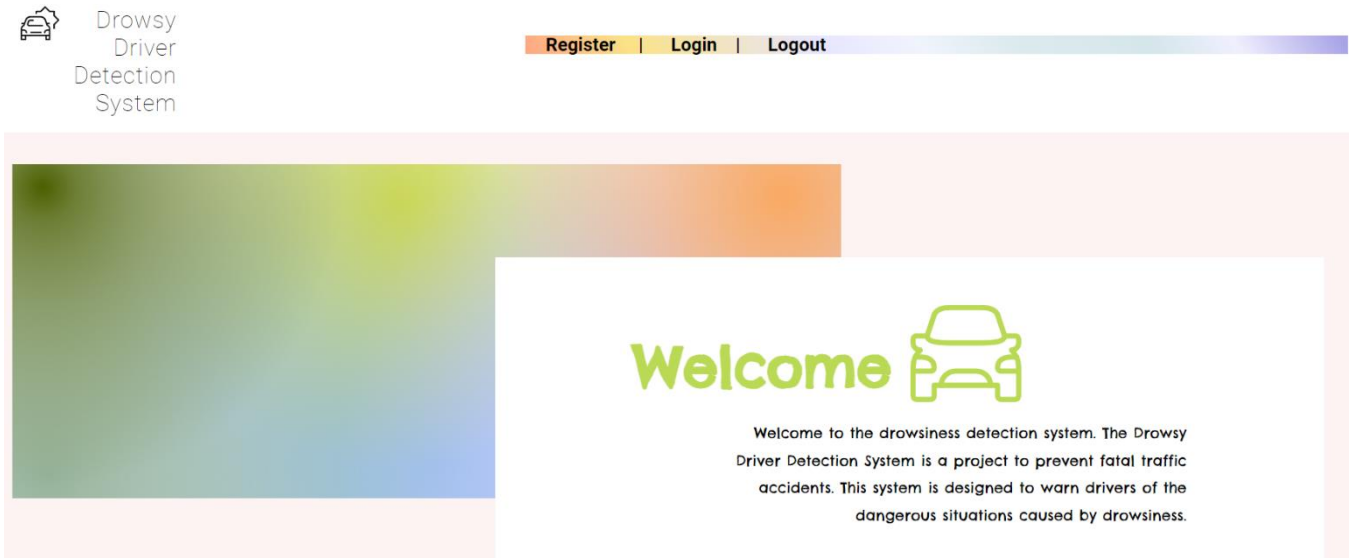

Figure 1, Visual Studio page to run the GUI

- After the Start button is clicked, then the program is built and run.

1.3.3 Installation

- From the guide above, after the program is started, all part of the project can be used.
- Main code will be added to this repository. While downloading, you can download all required library via this code part "pip install -r requirements.txt".
- You firstly need to download requirements.txt to your local from this directory.
- After this process, you can download main code in DrowsyDriverDetectionSystem File, and you can open the codes in Visual Studio Enterprise. Push the solution file and debug for working.
- You can reach all documents and codes, also you can find all code in first release file in DrowsyDriverDetection.rar1 without git. Please follow steps are mentioned in below:
- Make sure that Git is installed. If not, you can download and install it from the official website: "https://git-scm.com/downloads"
- Open a terminal (Linux/Mac) or Git Bash (Windows) application.
- If you're using Git Bash, switch to the Bash interface: "git bash."
- Navigate to the folder where you want to download the code: "cd /path/to/folder”!
- Clone the Git repository: "git clone https://github.com/CankayaUniversity/ceng-407-

408-2022-2023-Drowsy-Driver-Detection-System.git"

- The Git repository will be downloaded, and a folder named ceng-407-408-2022-2023-Drowsy-Driver-Detection-System will be created for all documents and codes.
- Once the download is complete, navigate to the folder for reaching codes: "cd DrowsyDriverDetectionSystem". When you upload all files and codes, you need to also download best.h for classification. You can find this file in release file.
- You can run the project "python views.py".
- Also, you may use this process for running. After the download is complete, you can run the project via Visual Studio Enterprise or Code.