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**FACULTY OF ENGINEERING**

**COMPUTER ENGINEERING DEPARTMENT**

**Test Plan, Test Design Specifications and Test Cases**

**Version 2**

**CENG 408**

Innovative System Design and Development II

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**FATIGUE DETECTION**

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# INTRODUCTION

## Version Control

|  |  |  |
| --- | --- | --- |
| **Version No** | **Description of Changes** | **Date** |
| 1.0 | First Version | Apr 24, 2020 |
| 2.0 | Second Version | May 28, 2020 |
|  |  |  |

## Overview

Designed system does not require any GUI but for testing the system a user interface needed which we will call it the testing interface. Detecting the user’s facial movements is fatal our system which means we will need the individuate the mouth, eyes and the entire face.

## Scope

This document will include the test cases that we will consider in Fatigue Detection system.

## Terminology

| **Acronym** | **Definition** |
| --- | --- |
| GUI | Graphical User Interface |
| UI | User Interface |

# FEATURES TO BE TESTED

This section lists and gives a brief description of all the major features to be tested. For each major feature there will be a Test Design Specification added at the end of this document.

## Face Detection (FD)

Face detection has a major impact in this system. According to detection of users’ face, the system will be able to detect other symptoms.

## Eye Detection (ED)

Frequently eye blinking is an important symptom for this system. Detecting the eyes will provide serious data to the system.

## Mouth Detection (MD)

Yawning is one of the most important symptoms to be able to detect yawning, firstly the system should detect mouth of the user.

## Road Lane Detection (RLD)

To understand the behavior of user, we will also consider lane tracking. This will provide more information to the system aside with other symptoms.

## Test Interface (TI)

This interface will contain different parameters, buttons and it will show the current images of both cameras in the car. We will also test this interface.

# ITEM PASS/FAIL CRITERIA

With the dataset that we have, we will test specific images, videos for the detection of the features that we mentioned above. We will test our code and if the accuracy is higher than 85%, we will accept it.

## Exit Criteria

* 100% of the test cases are executed
* 85% of the test cases passed
* All High and Medium Priority test cases passed

# REFERENCES

[https://github.com/CankayaUniversity/ceng-407-408-2019-2020-Fatigue-Detection/wiki/SoftwareDesign-Document](https://github.com/CankayaUniversity/ceng-407-408-2019-2020-Fatigue-Detection/wiki/SoftwareDesign-Document%20)

[https://github.com/CankayaUniversity/ceng-407-408-2019-2020-Fatigue-Detection/wiki/SoftwareRequirements-Specification](https://github.com/CankayaUniversity/ceng-407-408-2019-2020-Fatigue-Detection/wiki/SoftwareRequirements-Specification%20)

# TEST DESIGN SPECIFICATIONS

**5.1 Test Interface (TI)**

### Subfeatures to be tested

#### Camera Switch Button (TI.Cam.Swc.But)

Tester can switch between the two cameras (one for users’ facial movements control, other one is for road lanes) by selecting the camera button.

#### Fatigue Result (TI.Fat.Res)

This system measures fatigue level of the user. To measure the fatigue level, the system needs above features to work. According to these measures, the system will calculate the fatigue level and alert the user if it is too high.

#### Exit Button (TI.Exit)

### Test Cases

|  |  |  |  |
| --- | --- | --- | --- |
| **TC ID** | **Requirements** | **Priority** | **Scenario Description** |
| *TI.Cam.Swc.But* | *6.3.1* | *M* | *For accessing to the cameras.s* |
| TI.Fat.Res | *6.3.1* | H | Detect signs of fatigue and then warn if the result is positive(which means user is fatigued). |
| TI.Exit | *6.3.1* | L | Exit testing interface. |

# Detailed Test Cases

## TI.Cam.Swc.But

|  |  |
| --- | --- |
| **TC\_ID** | TI.Cam.Swc.But |
| **Purpose** | Switch between user and road lane cameras. |
| **Requirements** | 6.3.1 |
| **Priority** | Medium |
| **Estimated Time Needed** | 20 Secs. |
| **Dependency** | For both cameras there has to be an input. |
| **Setup** | No installation required. |
| **Procedure** | System is running |
| Open testing Interface |
| Select between cam1 and cam2 |
| **Cleanup** | Exit |

## TI.Fat.But

|  |  |
| --- | --- |
| **TC\_ID** | TI.Fat.Res |
| **Purpose** | Fatigue Detection |
| **Requirements** | 6.3.1 |
| **Priority** | High |
| **Estimated Time Needed** | 10 Minustes |
| **Dependency** | Symptom detection and comparasion. |
| **Setup** | No installation required. |
| **Procedure** | System is running |
| Open testing Interface |
| Both cameras are running. |
| System is looking for symptoms and analyzing |
| **Cleanup** | Exit |

## TI.Exit

|  |  |
| --- | --- |
| **TC\_ID** | TI.Exit |
| **Purpose** | Exit from the system |
| **Requirements** | 6.3.1 |
| **Priority** | Low |
| **Estimated Time Needed** | 10 Secs |
| **Dependency** | - |
| **Setup** | - |
| **Cleanup** | - |

# Test Results

### Individual Test Results

| **TC ID** | **Priority** | **Date Run** | **Run By** | **Result** | **Explanation** |
| --- | --- | --- | --- | --- | --- |
| TI.Cam.Swc.But | M | 15.04.2020 | Berkay Ekebaş | Fail | Input error. |
| TI.Cam.Swc.But | M | 16.04.2020 | Berkay Ekebaş | Pass |  |
| TI.Fat.Res | H | 25.04.2020 | Damla Ebru Parlak | Fail | The system failed to start. |
| TI.Fat.Res | H | 1.05.2020 | Damla Ebru Parlak | Fail | Algorithm errors. |
| TI.Fat.Res | H | 6.05.2020 | İrem Kaymakçılar | Fail | Algorithm errors. |
| TI.Fat.Res | H | 7.05.2020 | Damla Ebru Parlak | Fail | Algorithm errors. |
| TI.Fat.Res | H | 11.05.2020 | İrem Kaymakçılar | Fail | Algorithm errors. |
| TI.Fat.Res | H | 12.05.2020 | Damla Ebru Parlak | Fail | Symptom detection error. |
| TI.Fat.Res | H | 14.05.2020 | Berkay Ekebaş | Fail | Symptom detection error. |
| TI.Fat.Res | H | 15.05.2020 | İrem Kaymakçılar | Fail | Symptom detection error. |
| TI.Fat.Res | H | 17.05.2020 | Damla Ebru Parlak | Fail | Accuracy lower than expected (85%) |
| TI.Fat.Res | H | 19.05.2020 | Berkay Ekebaş | Fail | Accuracy lower than expected (85%) |
| TI.Fat.Res | H | 20.05.2020 | Damla Ebru Parlak | Fail | Accuracy lower than expected (85%) |
| TI.Fat.Res | H | 20.05.2020 | Irem Kaymakçılar | Fail | Accuracy lower than expected (85%) |
| TI.Exit | L | 18.04.2020 | Berkay Ekebaş | Pass |  |

* 1. **Summary of Test Results**

| **Priority** | **Number of TCs** | **Executed** | **Passed** |
| --- | --- | --- | --- |
| H | 1 | 25 | 0 |
| M | 1 | 10 | 6 |
| L | 1 | 10 | 10 |
| **Total** | **3** | **45** | **16** |

* 1. **Exit Criteria**

|  |  |
| --- | --- |
| **Criteria** | **Met or Not** |
| 100% of the test cases are executed | Y |
| 85% of the test cases passed | N |
| All High and Medium Priority test cases passed | N |

* 1. **Known Problems**

Fatigue definition can change from person to person and it is a very versatile issue. Therefore, there is no specific definition of “Fatigue”. Also, we can say that there are many anti thesis about this topic according to our researches.

## Conclusion

It can be seen from the results that the expectations did not meet with reality. According to these test results, the product is not ready for use. On the other hand, this system is open to any kind of improvements.