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**MANUKAU INSTITUTE OF TECHNOLOGY**

Faculty of Business and Information Technology

**PROJECT PROPOSAL**

**Driver Safety & Drowsiness Detection System**

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| **Module** | : | **Hot Topic in Software** |
| **Supervisor** | : | **Fadi Fayez** |
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# 1. INTRODUCTION

## 1.1 Problem Description

Automobile has become a major part in our lives. They are used for transportation of people, items and any many other from one place to another. Whatever the automobile type (car, van, bike etc.) is being used for transportation, the safety should be a number one priority. While transporting people or any other item we should think about the safety of the passengers of the vehicle, public and private and public properties. According to Ministry of Transport, New Zealand (2018) number of road deaths has been increased from 284 to 393 within the period of 2011 to 2018. They also state that the number of reported injuries in transportation has amplified from 11,000 to 13,000 within a period of 5 years until 2017. Above statistics confirms that there should be a lot of improvements in the automobile and transportation industry for safety and the wellbeing of humans as well as the safety of private and public property.

There are various factors which contributes to road injuries and deaths. Some of them are lost control of the vehicle, speeding, alcohol, driver drowsiness, weather conditions, vehicle conditions and so on (Ministry of Transport New Zealand, 2018). Most of the time drivers do not care about the state of themselves prior to driving a vehicle. Even though the driver is tired, sleepy or has consumed alcohol he/she tries to drive a vehicle without any anxiety. As a result, it causes road accidents, injuries, loss of lives and damage to property. There aren’t many systems which could predict the conditions of the driver prior to a trivial incident which could assist the driver immensely. Therefore, this project mainly focuses on the driver drowsiness and how it can be identified using computer vision and facial features in order to provide necessary alerts to the driver when required as a warning, so that the driver can decide whether to continue driving or not and take a proactive approach to such incidents rather than a reactive approach.

## 1.2 Solution & Research Question

Since the road safety is the main priority, most of the high-end vehicle manufacturers implement safety systems in their vehicles. Unfortunately, these vehicles are expensive and most of the people can’t afford to buy them. Therefore, our research questions focus on improving the automobile safety practices by using computer vision and low cost hardware and improving the automobile safety practices by monitoring facial gestures of human.

The proposed solution will be implemented using image processing, computer vision and facial recognition techniques to increase the efficiency and the accuracy of the system. A camera will be the main hardware device to capture images of the eyes and this will reduce the cost of other expensive hardware devices such as embedded sensors and chips.

## 1.3 Scope

Proposed driver safety and drowsiness detection system will be a desktop application at its first stage as a prototype. In this system, camera will be placed in front of the driver to capture images of the driver’s face and eyes. At the same time camera will provide live stream to the application to process with face recognition and image processing techniques. By the process of execution the system will detect the status of the eye (open or closure) and alerting the driver according to the eye status. Basically if the eye closure status is higher than the open status within the given time period the system will alert the driver by providing a sound.

**Aim of the project**

The aim of this proposed system is to develop, user friendly, efficient, accurate and low cost application using image and video processing algorithms to detect driver drowsiness to reduce road accidents and increase driver safety.

**Objectives of the project**

1. Research on the identified areas relevant to the project and come up with the Literature review. The literature of the project consists of existing driver safety system and its functionalities. Also the comparison table of the existing systems.
2. Design the system architecture according to the gathered information from the research process.
3. Implementing the finalized design.
4. Testing and evaluate the implemented product.
5. Make the deliverable on time.

**Project Deliverables**

* Research project proposal template
* Research project proposal
* Final project report
* Prototype of the system

## 1.4 Measurable Organizational Value

# 2. Literature Review

## 2.1 Overview

## 2.2 Existing Systems

# REFERENCES

https://www.transport.govt.nz/resources/road-safety-resources/roadcrashstatistics/monthlyoverviewofcrashstatistics/monthly-road-crash-statistics-update-march-2018/