**CHAPTER 1**

**INTRODUCTION**

This chapter explains about introduction of the proposed system, objectives of thesis, scope of thesis, outlines of thesis, and summary.

* 1. **Introduction**

One of the major causes behind the casualties of people in road accidents is driver’s drowsiness. Various studies show that around 20% of all road accidents are fatigue-related, up to 50% on certain conditions. One of the ways to reduce this percentage is to use Driver drowsiness detection technology. To encounter this worldwide problem, a solution that is Driver Drowsiness Detection and Alert System. It determines drowsiness using EAR (Eye Aspect Ratio) and pre-trained model using Ensemble of Regression Trees Method.

After continuous driving for long time, drivers easily get tired resulting into driver fatigue and drowsiness. Research studies have stated that majority of accidents occur due to driver fatigue. Different countries have different statistics for accidents that occurred due to driver fatigue. If the accident caused by abnormality of the driver, it can be prevented by placing abnormality detecting system within the vehicle. Driver fatigue is a significant factor in a large number of vehicle accidents. The development of technologies for detecting or preventing drowsiness at the wheel is a major challenge in the field of accident avoidance systems. By monitoring the eyes, it is believed that the symptoms of driver fatigue can be detected early enough to avoid a car accident. Developing technology for detecting driver fatigue to reduce accident is the main challenge.

Detection of fatigue involves a sequence of images of a face, and the observation of eye movements and blink patterns. The system is developed using Ensemble of Regression Trees. The focus of the system is on accurately determining the open or closed state of the eyes. Depending on the state of the eyes it can be said whether the driver is alert or not. If the driver is going to drowsy, the system will alert with sound.

**1.2. Objectives of Thesis**

The objectives of driver drowsiness and alert system are as follows:

* To prevent and reduce the accidents caused by the driver getting drowsy
* To detect drowsiness
* To alert if the driver is going to drowsiness
* To know how to apply ensemble of regression trees method

**1.3. Scope of Thesis**

The scope of the driver drowsiness and alert system is as follows:

* Detection of driver’s drowsiness using ensemble of regression trees algorithm
  + Alert with sound if the driver is going to drowsiness

**1.4. Outlines of Thesis**

The introduction, objectives, scope of thesis and outlines of thesis are mentioned in chapter one. In chapter two, literature reviews of driver drowsiness and alert system are expressed. The related theories are explained in chapter three. In chapter four, design and implementation of driver drowsiness and alert system are explained and the result of the system by using ensemble of regression trees algorithm. In chapter five, discussion, conclusion and further extension are discussed.