A STUDY ON DRIVER FATIGUE NOTIFICATION SYSTEMS

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ABSTRACT

This paper is an introduction to our research which aims to develop a driver safety assistant system using an in vehicle video camera. It is a real-time recognition system which uses vision sensors to detect passengers and driver fatigue conditions. The system assesses the ability of conducting safe driving and notifies the driver for any dangerous situation. Moreover, safety actions are to be performed by an embedded vehicle controlling system. This review paper is to assess the current status of research.

Keywords: Computer Vision; Safety; Fatigue Assessment; Intelligent Transportation Systems.

INTRODUCTION

Traffic accidents are a serious global problem. "Global status report on road safety 2013" (WHO, 2013) indicates that worldwide the total number of road traffic deaths decreased from 1.3 million per year in 2009 to 1.24 million per year. This number remains unacceptably high. Moreover, on the local level, traffic accidents rank fifth among the leading cause of deaths in Malaysia (Nurulhuda et al., 2010). Studies show that for personal injury accidents, estimates of sleep and fatigue involvement are in the range of 10 to 30 percent of accidents (Sagberg et al., 2004). One solution to reduce this huge number of loses is developing driver assistant systems. In our research we plan to develop a driver safety assistant system which uses vision sensors to detect passengers and driver fatigue conditions. The new in this research is the real-time safety actions to be performed by an embedded vehicle controlling system. The fatigue assessment system is based on real-time face and gesture recognition.

The motivating application for this research is to design an integrated system for safety of vehicle users based on visual information only. Restricting the methods to visual information is to reduce the time complexity of integrating information from many sensors and to reduce the expenses on the sensors. This research aims to contribute in reducing number of accidents and consequently the socioeconomic effects of accidents like property losing costs, long-term medical costs, funeral costs, vehicle repair costs or losing the household.

The most recent literature revision we found is (Williamson & Chamberlain, 2005). A newer revision is needed to cover the gap since the last revision.

DRIVER FATIGUE DEFINITION AND ASSESSMENT

Fatigue "concerns the inability or disinclination to continue an activity, generally because the activity has been going on for too long". The causes of fatigue can be