**Introduction**

Most of the car crash happened today is due to human error \cite{crash} where some of them lead to death. To reduce this occurrence, various method has been developed including Advance Driver Assistance System (ADAS). The role of ADAS is to prevent deaths and injuries by reducing the number of car accidents and the serious impact of those that cannot be avoided \cite{adas}.

According to The American National Highway Traffic Safety Administration\cite{america} – `` 10–15% of car accidents are related to lack of sleep’’. This is the reasons one of the main components of ADAS is detecting the driver drowsiness. In recent years, many algorithms have been proposed to detect driver drowsiness.

Drowsiness detection techniques can be classified into three categories: physiological measures, vehicle-based measures, and face analysis \cite{e2}. Vehicle-based measures, where sensors are installed in the vehicle components to monitor driving performance and identify driving trends in order to detect drowsiness, detect it by analysing vehicle behaviour such as steering wheel movement, random braking, and speed changes. Adopting vehicle-based solutions has the major issue that the vehicle's behavior can change due to poor weather and road conditions.

The biggest drawback of using physiological approaches is that it's important to ensure driver comfort while wearing sensors, as physiological measurements depend on bodily factors like heart rate, body temperature, pulse rate, and others, as physical conditions change as a driver grows fatigued.

Behavioural measures or face analysis detect drowsiness by observing facial expressions and movements using machine learning and computer vision (CV). This techniques seems more driver friendly, Thus become the main interest of this paper, where a method for driver drowsiness detection using deep learning is proposed.

The rest of the paper is presented as follows: Section 2 presents the background on deep learning models and definition of terms used in this paper followed by related works in section 3. The Details of the proposed methods are presented in Section 4. The experiment on the proposed model is discussed in section 5 with the result. Finally, conclusion of this paper on Section 6.