

UNIVERSITI TEKNOLOGI MARA

**CRASH DETECTION AND EMERGENCY RESPONSE
(CRADER) SYSTEM**

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ABSTRACT

Several road accident victims who survived the accident could not be saved since help arrived late owing to serious injuries and there were also accident victims who were trapped in cars that caught fire because of the accident. The aim of this project is to design a system that can detect crash of vehicles and emergency response during the accident. The project has been developed by using Arduino Uno, Accelerometer, Flame Sensor, GPS Module, GSM Module, and automatic fire suppression. The process of this project starting with the input received by the Accelerometer for the crash detection, then if accident occur, the GPS Module will detect the location and send the location to the GSM Module where it will send notification to alert the people on their smartphone through SMS. The Flame Sensor is used if the flame or spark presence around the vehicles and if the flame presence, it will trigger the ABC Dry Powder to spread the ABC dry powder to the certain part of the vehicles. This system will help to solve the problem that occurs during an accident to save the lives of people and prevent the vehicles from being burned. Arduino Uno, Accelerometer, Flame Sensor to improve the accident detection and emergency system. CraDER System focused on developing a system tool that can assist accident victims and function as a preventative measure to stop vehicle fires and more serious injuries from occur. This project contribution focusing on society where most of the people use vehicles as a transport from one place to the destination every day.

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CHAPTER ONE

INTRODUCTION

1.1 Project Overview

According to the World Health Organization's (WHO's) in the global status report (2018), approximately 1.35 million deaths each year because of the road traffic crashes and 54% of it were caused by vulnerable road users. In Malaysia, there were 15,044 traffic incidents in total in 2019, resulting in 6,167 fatalities, 3,022 serious injuries, and 5,855 minor injuries. According to the Malaysian Institute of Road Safety Research (MIROS), the number of registered vehicles climbed from 6,802,375 in 1995 to 22,702,221 in 2012, which is more than three times the amount from that year. Road fatalities are on the rise and are now considered a global problem in all nations [1].

Nowadays, there are already many accidents detection system that being used in daily life. Most of the accidents detection system have safety system that will be automatically break the vehicle to stop it if the vehicle got crash and airbag system for car, van and lorry. However, what happen if people that involve in an accident got trapped in the car or fainted in the car and suddenly the car got fired? Are the victims can be saved? Victims of the car accident maybe can be saved if there are something system that can avoid the car from being burned. Therefore, this proposed project is developed using Arduino Uno, Accelerometer, Flame Sensor, GPS Module, GSM Module and automatic fire suppression to improve the accident detection and emergency system.

1.2 Objective

- i. To develop a prototype of the Crash Detection and Emergency Response (CraDER) System as an embedded system using Arduino Uno
- ii. To demonstrate the effectiveness of the Crash Detection and Emergency Response (CraDER) System in real life situations.