

UNIVERSITI TEKNOLOGI MARA

**FABRICATION OF ROBOTIC
FIREFIGHTING**

**MUHAMMAD ZULQARNAIN BIN
ABDUL RAHMAN**

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ABSTRACT

Now days there are a lot of fire cases due several reason and because of that firefighters tend to had a lot more job in a more job that can cause their life due to the traditional firefighting methods. Such as, working in a large fire that can cause heat exhaustion upon the firefighters, thick smoke that can affect their visibility and unstable structure that can collapse anytime. So, the objective of this project is about developing a firefighting robot that can autonomously enter hazardous fire situation without risking any human life, the robot is tasked to detect fire source and efficiently distinguish fire while reducing risks to human responders. The robot consists a set of heat sensors for high temperature and control algorithm to move the robot and extinguish the fire source. It is anticipated that the development of firefighting robot will significantly enhance firefighting operations by improving response times, reducing human exposure to hazards, and increasing overall operational efficiency. The robot's autonomous capabilities and functionalities are expected to contribute to safer and more effective firefighting practices in challenging scenarios.

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CHAPTER ONE

INTRODUCTION

1.1 Background of Study

In this day, the fire rate per day is getting higher due to a lot of factors and the cause of the fire is starting to get dangerous upon the victims and especially the safety workers themselves, raising a load of concern among many organizations, especially firefighters. As of 16 May 2023, there were 15,867 fire cases recorded in Malaysia. Among these, Selangor recorded the highest number of cases compared to other states, with 5,136 cases [1].

Due to the increasing number of fire cases, it's starting to be a burden to our local firefighters due to various causes related to fire and other emergency issues. Fire cases, in particular, bring a lot of trouble to the safety workers, especially firefighters, such as low visibility due to thick smoke and unstable buildings, which can lead to many bad consequences that can put the safety workers' lives in danger [2].

Even though the growth of technology today is enormous, most fire departments still maintain the traditional methods to extinguish fires. For example, they often send a group of firefighters into the burning site without knowing the cause of the fire and the specific problems they will face. This method is no longer relevant as it only increases the risk of fatalities among firefighters and the victims caught in the fire [3].

The use of robots nowadays is growing. For instance, in China and Japan, robotic technology is being implemented everywhere in the country. Examples include robots that serve customers and surveillance robots that ensure community safety. Therefore, we can also build a robot that can efficiently extinguish fires. By having a robot that can efficiently extinguish fires and enter the site without any problems, we can increase firefighters' work efficiency and decrease the fatalities they face [4].