

Universiti Teknologi MARA

**The Coordination of Multi-Robot Arduino for Searching
Victims under Collapsed Building**

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ABSTRACT

Each and every year humankind encounters unforeseeable scales of catastrophic events which under the circumstances, victims are being trapped under the rubbles following three or four days either in conscious or unconscious state. Given the high demand for an autonomous machine to deal with search operations efficiently, the paper aims to design autonomous multi-robot able to collaborate with each other in operating human victim searching under collapsed building. The robot prototype is equipped with Arduino Uno as the microcontroller, which is a very low cost alternative compared to the current expensive microcontroller. The prototypes only utilize Ultrasonic sensor to detect human victim due to the cost limitation, PIR sensor, which is the best sensor to detect human presence cannot be utilized. The proposed paper also involves the design of algorithm for communication between the two robot prototypes when operating searching task.

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CHAPTER ONE

INTRODUCTION

In this chapter, a brief explanation regarding projects background and other related component for detailing project proposed will be explain.

1.1 Research Background

Each and every year humankind encounters unforeseeable scales of catastrophic events which come from natural's causes like the occurrence of earthquake and human-made causes such as the collapses of buildings (Karthikeyan, 2016). Under the circumstances, victims are being trapped under the rubbles following three or four days either in conscious or unconscious state. Long ago in 1993, an avalanche occurred resulting in the collapse of Highland Towers, 48 people were dead (Kazmi, 2017). And also on April 2015, an extreme quake hit Nepal with an extent of 7.8 magnitude caused the deaths of 8,500 people (Moumita, 2017).

Amid these crisis circumstances, particularly in urban fiasco, a wide range of individuals are conveyed, for example, policeman, fire fighters and staff of medical assistance. In such circumstances, these individuals plays out their part in hazardous circumstances caused by destructed surroundings, they work in crumbled fabricating, avalanches, pit and so on., by this the rescuer motivates chance to save the victims who needs rescues (Karthikeyan, 2016). However, the process would be quite difficult if it involves tight and narrow space which can complicate the rescuer in locating the victim location.

For this situation, we could use many small size robots since the robot needs to go through narrow gateways in a minute time to search for the victim that may be still alive but cannot move a lot due to injuries. The robot is designed to recognize its ebb and flow position, look through the zone to search for victim and if the robot found the victim it will