



Control Of An Autonomous Industrial Fire Fighting Mobile Robot

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ABSTRACT

This paper describes the construction and design of a fire fighting mobile robot (FFMR). The system controls two optically isolated D.C. geared motors. The robot performs analog to digital conversion on 5 infrared sensors: two to control the motion of robot and three for candle detection. The extinguishing system is comprised of a D.C. water pump and a water container. The experimental results are included to illustrate the detailed operational mode of the FFMR.

Keywords: Autonomous Mobile Robot, Micro-controller, Fire Extinguisher, Candle, Pump and D.C. geared motor.

INTRODUCTION

Robot is a machine that looks like a human being and performs various complex tasks. There are many types of robots such as fixed base robot, mobile robot, underwater robot, humanoid robot, space robot and medicine robot etc. Fixed based conventional manipulators have limited workspace due to their fixed based structure. It is possible to increase the workspace of the robots by a mobile platform. These types of robots are called mobile robots and play an important role in mining, military, forestry and security etc. Mobile robots have many applications where human lives are very dangerous, for example: extinguishing fire in tunnels, in industries, hospitals, laboratory and in house uses.

Control problems are very complicated due to external disturbances and robot environment. In the past literatures, many algorithms have been developed to design or improve the model for fire fighting robots (1–5). In (6), a fire fighting robot that detects fire with multiple sensors is proposed. A new swarm robotic platform for a fire detection task called FiFiBot is proposed in (7). In (8), an intelligent sensor based security system that contains a fire fighting system in our daily life is designed.