Stair climbing robot with Fire Fighting Mechanism

Shounak Chakraborty, Aarti, Shweta Srikkanth, Shashank Sharma,*Dr. Rakhi Narang, and *Dr. Lalita Josyula
Sri Venketeswara College, University of Delhi, New Delhi, India
E-mail: shounakcy@gmail.com, aartimaurya13@gmail.com, shwetasrikk@yahoo.com, sharmashashank387@gmail.com, rakhinarang@gmail.com, lchamarthi@gmail.com

Abstract— *In this project, we propose to design an autonomous robot that can climb stairs and extinguish fire. The robot is designed to reach un-accessible areas like stairs, uneven path and would douse fire for humans risking their life daily. In today's world, robots are increasingly being integrated into working tasks to replace humans. Several types of mobile robots with different dimensions are designed for various robotic applications. Therefore, in this work, we will try to come up with a product which will be a fusion of both stair climbing and Fire Fighting mechanism. Stair climbing method has been utterly studied by us and practically implemented. Thus, our approach is to combine Stair Climbing with Fire Fighting mechanism using flame and temperature sensors to detect fire and douse fire using water-pump or carbon-dioxide carrier. Thereafter, we will look forward to Image processing using MATLAB which will capture the image of fire at larger scale instead of sensors which will make it more efficient and help in the surveillance.*

Keywords- Robotics, Mechanics, Arduino, Fire Fighting, Computer Vision, MATLAB.

I. Introduction

In today's world, robots are increasingly being integrated into working tasks to replace humans. They are currently used in many fields of applications including office, military tasks, hospital operations, industrial automation, security systems, dangerous environment and agriculture. Several types of mobile robots with different dimensions are designed for various robotic applications. The robot has been designed to climb stairs and extinguish fire for the purpose of aiding rescue people. Common situations that employ the robot are urban disasters, hostage situations, and explosions.

II. Methodology

In today's world, robots are used for almost all purposes. They find their application in defense, surveillance, transport and in many other places. The task is divided into 4 phases.

Phase I: In this phase the robot has been assembled**.**
Phase II: Our aim is to make the robot follow a wall and climb the stairs so that it can traverse the entire arena.
Phase III: In this phase we will add an application to a stair climbing robot which will be firefighting mechanism. This robot will sense fire and help in fighting fire.
Phase IV: Image processing using MATLAB will be our future work in which we will use camera to capture the image of fire at larger scale instead of sensors which will make it more efficient and help in the surveillance.

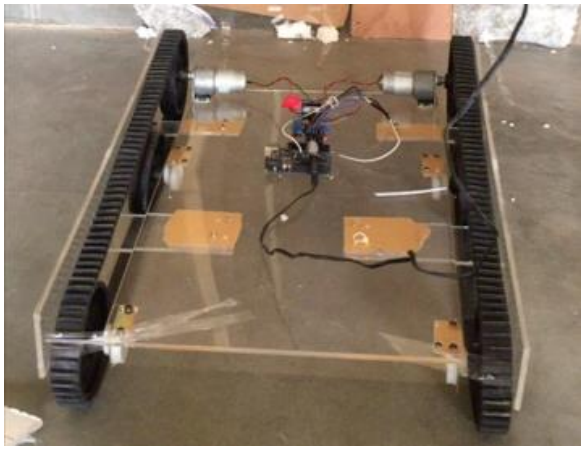

Fig1.1 Mechanical model of stair climbing Robot

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References

[1] http://www.stairbot.de/en_beschreib.htm
[2] http://www.edgefxkits.com/fire-fighting-robotic-vehicle
[3] http://www.edgefxkits.com/fire-fighting-robot-remotely-operated-by-android-applications.
[4] http://www.robot-and-machines-design.com/en/Articles/Mechanics/Tips-Guides/264-Motor- Selection-How-To-Select-A-Motor-How-to-Choose-A-Motor.html
[5] https://www.intorobotics.com/2-simple-methods-choose-motors - wheel-drive-robots/

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