IoT Based Fire Fighting Robot

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***Abstract*: With the advent of technology, humans are replaced with robots in life-threatening situations. We aim to design a robot capable of detecting and suppressing fires. By designing and implementing an autonomous robot capable of detecting and extinguishing flames, disasters can be avoided with minimal risk to human life. In this research, we illustrate an autonomous robot capable of detecting flames indoors and maneuvering towards the flame to extinguish it with the help of carbon dioxide.**

*Keywords***: IoT chip, Driver circuit, Motors, Wheels, Water pump, Battery, Switch.**

1. Introduction

What is Robot? As strange as it might seem there is no standard definition for a robot. However, there are some characteristics and features can be used for counting a device or a machine as a robot. First of all, a robot has to be aware of what is happening in its environment, needs to be able to move and powered by an energy source, if it is necessary a robot has to be smart enough to satisfy the requirement. Robots can be categorized according to their intelligence as follow; Manual robot is a system that can sense and convey the motion, gets energy from human power. For example, door hinge. When someone wants to open or close the door, it senses the motion from one side then conveys to other side and get the energy from human's arm. Semi-autonomous system is able to do everything done by a manual robot.

In addition, it has to complete tasks defined by a human. Therefore, sensors and control algorithms are employed for this system's intelligence. For example, a remote controlled mobile robot should be able to understand commands and execute the task. Electrical power, batteries, etc. are used for energy consumption. The most important thing to counting a system as autonomous is decision mechanism. An autonomous robot can do everything done by the others and it makes decision in dynamic environmental conditions as well. For example, an UGV (Unmanned Ground Vehicle) is able to sense, consider and decide. Robots are used in wide variety of fields (Gupta et al., 2006). Robot manipulator also known as robot arm is used to perform tasks in industry such as welding, painting, palletizing etc. due to its power, rigid body, speed and accuracy. Recently; the usage area of the robots is shifted from the classical industrial manufacturing robot to service robot (Tajiti

et. al., 2013). Medical robot has invaded the field of medicine. Although this system hasn't taken place of the medical personnel many robotic applications have emerged in medical area such as laboratory robots, surgery and training of surgery etc. Rehabilitation robot also has been used to help people with disabilities. Mobile robot is a system able to conduct tasks in changeable conditions and different places by a platform and locomotive elements. Locomotive system is varied according to operation environment. In the aquatic and aerial environments, propellers, screws and legs are generally used while; wheels, pallets and legs are used in terrestrial environment.
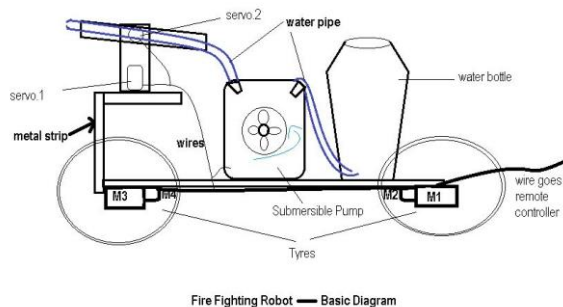
2. Diagram of IoT based firefighting robot

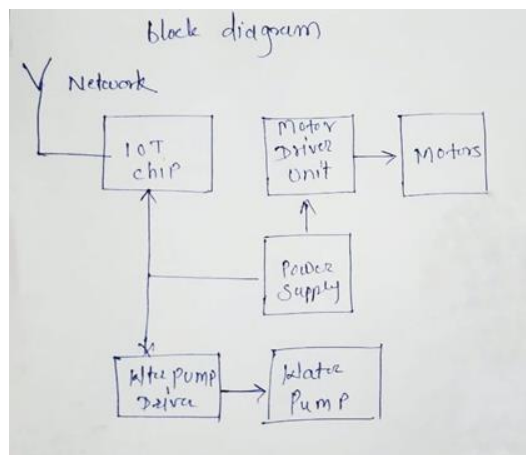Fig. 1. IoT based firefighting robot

3. Working principle

Fig. 2. Flow chart of IoT based firefighting robot

International Journal of Research in Engineering, Science and Management
Volume-3, Issue-4, April-2020
www.ijresm.com | ISSN (Online): 2581-5792

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4. Advantages

- To detect the exact direction of the fire source.
- Capability of sensing accurately with increased flexibility.
- Reduce human effort.
- Reliable and economical.
- Not sensitive to weather conditions.

5. Future scope

Use for every home, every private purpose and for less expense for everyone can use easily that would be the one of the future implementation. Now robot body is not a fire proof for that body could be damage so that in future, will work for this robot body as a fireproof body. For future want to add automatic obstacle measurement sensor which would detect obstacle automatically and vehicle will stop automatically if vehicle detect any obstacle in any side of the robot.

Acknowledgement

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