DESIGN AND IMPLEMENTATION OF CORONA FIGHTER ROBOT USING REAL TIME CLOCK

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Abstract - : The proposed work in this paper mainly focuses on the design and development of the assistive robot for the disabled and the patients in need. This work addresses the challenges of the robotic field to improve the supply of health care services to patients in the upcoming development. The assistive robot developed in this work includes both hardware and software design. The combination of the IR sensors, real time clock (RTC) and microcontroller manages the overall operation of the system. Hardware includes grippers with flexible arm which is used to pick and place operations and the sensors are used for the detection of an action. IR sensors are used for obstacle detection, range determination and obstacle avoidance. In order to validate the designed hardware and software a case study of assisting the bed ridden patient by delivering medicines on time is considered so that more importance is given to nursing care residents. Experimental results demonstrated its proper functioning by delivering prescribed tablets by automatically moving towards the patient as per the timeline indicated in real time, which is demonstrated using developed prototype model.

Key Words **: Robot(AGR), IR Sensor, Real time clock(RTC), Microcontroller**

1. INTRODUCTION

A robot is basically a virtual or mechanical artificial agent which gives a helping hand to the humans thereby reducing their work pressure. It is usually an electromechanical system by its appearance and movements. It can do its work on its own by predefined order or message by the user. The robots are classified into 4 categories according to their main functions [1]. They are mobility, moving and transport of patients from one location to another; physiological monitoring, to evaluate the physiological conditions of patients and monitor their health status remotely; assistance with daily activities, assistance in carrying out activities related to self-care; and rehabilitation, to assist the patient in the rehabilitation Process. infrared sensor, ultrasonic sensor, laser range finder and so on. Among them infrared sensor is most suitable for the obstacle detection because of its low.

A robot used in social causes such as providing assistance to the patients and elderly people. Such robots are called Socially Assistive Robots. These are used to ease the work of the nurses in hospitals or relatives at home, as they cannot monitor the patients all the time . Therefore, robots are used to provide assistance in day to day life as they are safe and comfortable.

Sample paragraph, the entire document should be in Due to loss of memory the patient may lose track of time and not take the appropriate medicines at the proper time. Many works have been carried out in the literature to address the above issues. One among them is the usage of assistive robots wherever possible to help the needy people. Mobile robots assist with transport tasks or guiding people can help patients become more independent. The robot carries all the required equipments for the patient. Hence it makes the patient independent and speed the recovery by improving their physical as well as a mental state. It will autonomously follow the person using a unique color coded marker on them and also avoids obstacles on the way. It also functions as an Internet.

Therefore, in this paper, a health care assistive robot is designed to assist the bed ridden patient by delivering the medicines to the patient on time as shown in fig 1.1. The robot is also designed to assist the patient based on his/her requests. The robot reaches the patient successfully by determining the shortest distance and avoiding obstacles along the path with the help of IR sensors.

They are used for many purposes like obstacle detection, path following, arm design, etc. To reach the patient, the robot needs to find its path by avoiding the obstacles. The Line follower robot can detect and follow the line drawn on the floor.

Methods of obstacle avoiding are different according to the use of sensors.

2. METHODOLOGY

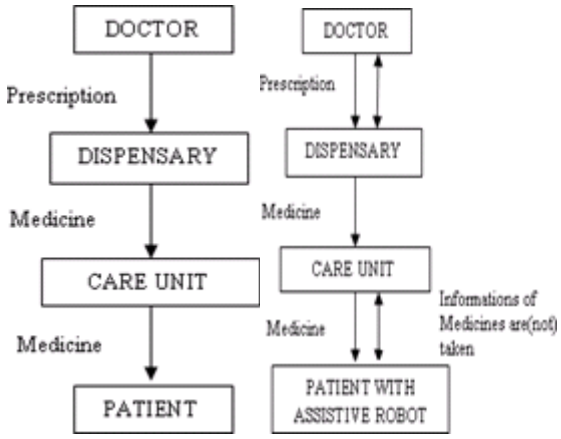

Fig -1: Framework of proposed architecture in robot.

2.1 System Architecture

The healthcare robot is described with a block diagram as shown in figure1.Since the desired goal of this robot is to avoid obstacles along its path and to determine the distance to the reach patient. The block diagram of the obstacle detection and avoidance system for a robot .

The proposed robot and represents remote section which is kept at bed side of the patient. Depicts the block diagram of an obstacle detection and avoidance system.

The robot section consists of an Arduino Mega as a control processor which controls all the activities and the movements of the robot when initiated. The controller also controls the DC motor rotation by sending proper messages to the driver circuits.

The designed assistive robot that carries medicines to the patient at the right time by following the predefined path. The rotation of the DC motor caused by their driver circuit is due to the signals that are passed by the Arduino Mega controller . The sensors incorporated in the robot to pass the analog signals to the IC which is then converted to the digital source and are displayed on the LED for the user reference. The mobile robot is designed to explore in the environment by detecting obstacles and avoiding collision based on the distance measurement information obtained from the infrared sensors.

2.1.1 Path Decision

Path-planning is an important primitive for autonomous mobile robots that lets robots find the shortest – or otherwise optimal – path between two points. Otherwise optimal paths could be paths that minimize the amount of turning, the amount of braking or whatever a specific application requires. Algorithms to find a shortest path are important not only in robotics, but also in network routing, video games and gene sequencing.

Path-planning requires a *map* of the environment and the robot to be aware of its *location* with respect to the map. We will assume for now that the robot is able to localize itself, is equipped with a map, and capable of avoiding temporary obstacles on its way. How to create a map, how to localize a robot, and how to deal with uncertain position information will be major foci of the reminder of this class.

The problem to find a “shortest” path from one vertex to another through a connected graph is of interest in multiple domains, most prominently in the internet, where it is used to find an optimal route for a data packet. The term “shortest” refers here to the minimum cumulative edge cost, which could be physical distance (in a robotic application), delay (in a networking application) or any other metric that is important for a specific application. Once the environment has been discretized into a graph (note, a graph is only *one* possible representation), we can employ other algorithms from graph theory to plan desirable robot trajectories. For example, floor coverage can be achieved by performing a depth-first search (DFS) or a breadth-first-search (BFS) on a graph where each vertex has the size of the coverage tool of the robot. “Coverage” is not only interesting for cleaning a floor: the same algorithms can be used to perform an exhaustive search of a configuration space, such as in the example seen in Lecture #3, where we plotted the error of a manipulator arm in reaching a desired position over its configuration space. Finding a minimum in this plot using an exhaustive search solves the inverse kinematics problem. Similarly, the *same* algorithm can be used to systematically follow all links on a website till a desired depth (or actually retrieving the entire world-wide web).

3. CONCLUSIONS

In this work, a health care assistive robot is demonstrated through RTC in helping patients or elders to take their medicine at regular intervals of time without the help of some assistants. RTC sets the alarm time for the medicine to be taken and at that time the robot approaches the patient with medicine by avoiding obstacles. Hence this robot is mainly designed with a reminder system to alert the patient to take their medicine at the appropriate time of day. This automation mainly focuses on making the patients to remain at their respective places safe and comfortable. The patient can request an item by pressing the switches (RF transmitter). The robot receives the signal wirelessly through RF receiver and assists the patient accordingly. The robot can also avoid obstacles along its path successfully to determine the shortest distance to reach the patient. Future work is to enhance the features like GSM to the robot, as soon as patient consumes medicines a message can be sent to their caretakers. The arm of a robot needs to be replaced with hydraulic arm, to avoid the patient to bend over to

the robot to pick the items.

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