

Carebot: Elderly Assist Robot

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ABSTRACT: Creation of Significance from Obscure is the sole purpose of every scientific information, from miniscule space to mighty cosmos our search for truth was truly fulfilled with help of science. Science in terms of simplicity is nothing but immutable truth that lies concealed within the eye of providence. Machines are scientific craft build to give redemption from Human inefficiency within, from nanoparticles to large hadron collider, machines has given man the vital information as well as Aid to overcome hurdles throughout time. Human inefficiency increases over time, elderly stage is where we faces more hurdles, even our least concerns began to rupture as major concern . This is the second stage in human life where we need Nurturance, where we turn ourselves into a Wise Infant. Yet one's grip of own consciousness began to loose at this stage and human assist is salient and significant, especially assist of own progenies. Still our exhaustion could make us to ignore feeble circumstances that could in fact turn into a life threatening condition. Here human lassitude is not a fault, it's the incapability to replace our temporary intervals within our service to our elders is lethal. Here comes the role of CareBot, the appellation of a machine for Service Scalability. CareBot1 is modeled for simple service within simple design. The main objective is to cut cost and provide uncomplicated services. In CareBot1 feature like:

- I. Automatic pill dispenser
- II. Heart beat checker
- III. Temperature sensing

Are included. These features could help elders to meet simple issues like medicine time schedule, weekly or daily medical checkups. CareBot1 is QuadraWheeled linear navigating robot. To extend robotic platform to social service in middle class as well as rural society at an affordable range is CareBot's primal goal. CareBot1 can be improved with designs for elevated navigation, Arm extension etc. The future of robotics is inevitable, machines will rise beyond human imagination and Humans beyond their own

1. INTRODUCTION

Machine – Human Interaction : Machines are man made devices that collect information desired and required and processes them to derive the required output to a human. Thus practically machine is a human engineered object,

robot literally means “Labour”, it's a machine which cares the workload done by the human physically. Robots are always mistaken with Android. It's like all androids are robots but all robots are not android. Robots are designed to meet human requirements. CAREBOT is a Quadra wheeled linear navigating robot that functions of

- Providing pills on-time at predefined location.
- Providing basic medical functions like body temperature and pulse rate.

Implementing complex functions like face detection in real time makes things complex. Hence simple construction and methods are used in “CAREBOT1”. The main goal we focus in developing carebot1 is to provide a reliable and affordable machine that could assist elders in normal things where simple human error could occur. Or else things which could be helpful when more concern is given to a person Elderly should by assisted by their children it's the best of all a human could do morally. But every person has their own limits. One cannot look after former for 24*7 there should be a break to fill that shot of break we offer the solution through carebot1.

2. AUTOMATIC PILL DISPENSER:

Most elderly people forget medicines timing and most often dislikes taking drugs and thus they try to skip, to offer a solution to this in an affordable and reliable range carebot1 is provided with pre-defined automatic pill dispenser. To navigate the machine used light detection sensors and predefined location technique. If the person forgets to take pill on time a message as well as a buzzer goes on giving a sign to concerned person in charge of the former. Fingerprint locking system is used to provide child safety. The pill dispenser manages the task of giving med on due time and resolves its complexity. Simple solution that is affordable and fast is pre-defined location technique. Here we offer three techniques:

- BLUEPRINT TECHNIQUE: Taking the whole blueprint of the house and marking them digitally at various places and store in memory could provide locations where the bot needed to be present.
- STICKER – BASED NAVIGATION: Stickers that defines different parameters are attached at different locations and carebot1 try to search for

these stickers which could lead to its required destinations. Once stickers are memorized then it moves on its own.

- **LINE FOLLOWING:** CareBot1 uses simplest technique of line following. Here a long monochromatic or polychromatic strip is attached to the wall base of every room and bot identifies the strip and moves along till it finds the human and wait for their response. If no response is found required message is send and bot comes back to original place. If any obstacle is found bot tries to avoid it by obstacle avoidance technique.

3. BODY TEMPERATURE PULSE RATE CHECKUP:

Carebot1 is enabled with to provide a general medical checkup like body temperature and pulse rate to evaluate their medical conditions. Also by implementing more medical sensor the utility of carebot1 could be evaluated further. Through this simpler medical evaluation a person's medical condition could be evaluated and further medical proceedings can be done if required.

4. PILL DISPENSER WORKING:

PILL TAKEN ON TIME

- Processor is Arduino
- On time bot reaches predefined proximal destination
- Buzzer rings and the elderly person arrives
- His/her fingerprint is detected
- Servomotor runs and required pill on time is taken
- Message is sent via GSM
- BOT returns to original place.

PILL TIME MISSED

- On time bot reaches predefined proximal destination
- Buzzer rings and bot waits for required time period
- If no response the contrasting message of previous message is send to person in charge.

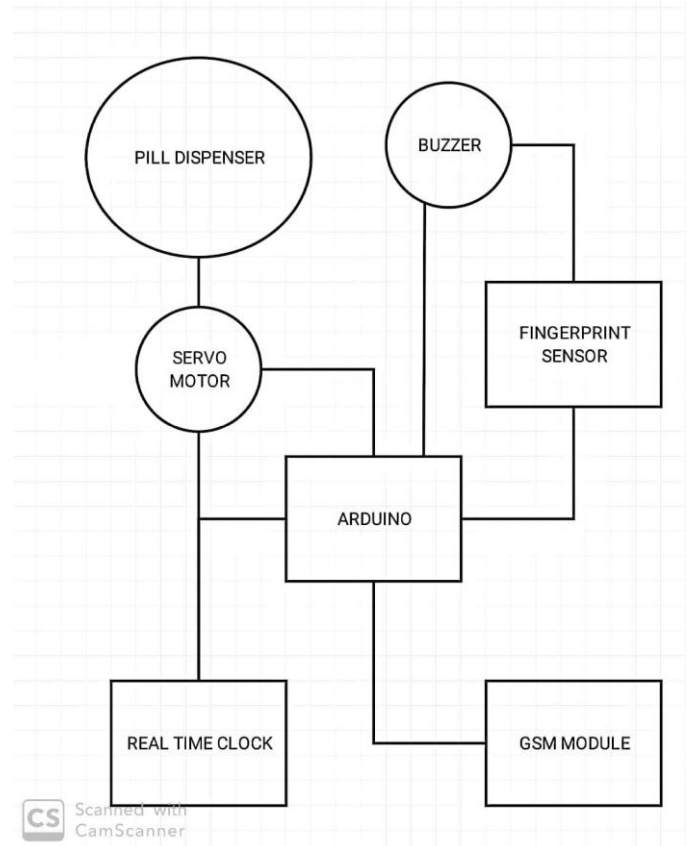


Figure 1: automatic pill dispenser block diagram.

5. HEART PULSE AND TEMPERATURE SENSOR WORKING:

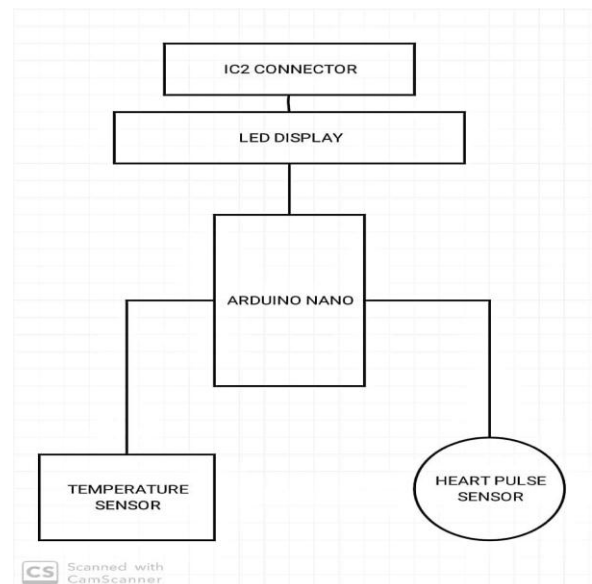


Figure 2: pulse and temperature sensors block diagram

- Finger pulse detection using light based sensors and value is displayed on led.
- The temperature sensor should be handled and measured properly to avoid real time error

6. PREDEFINED NAVIGATION using LINE BASED DETECTION

CAREBOT1 is designed to meet reliable mechanism thus from figure 3 we can find out the simple process of carebot1 navigation:

- Green line denotes the path to each destination
- The colour coded line is stored in the memory of bot.
- The destinations are labeled on the basis of their priority.
- To avoid obstacles an ultrasonic detector is used, otherwise an alarm goes in order to seek attention of a person nearby.
- Finally reaching Destination a buzzer rings or else a voice talks to gain required persons attention.

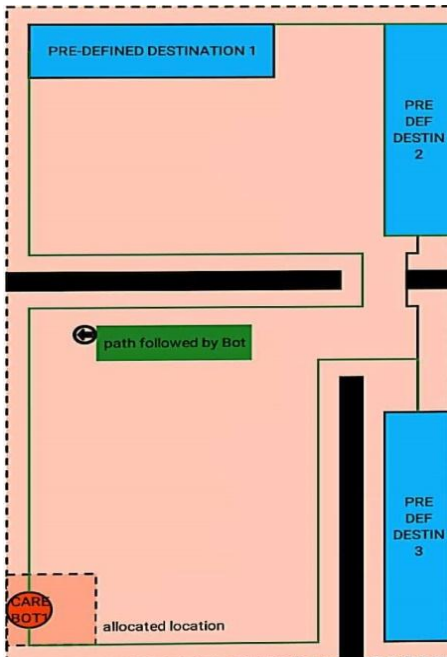


Figure 3: predefined location navigation.

7. RESULT

Resolving complexity and improving efficiency influences the technical and economical status of every commodity. Likewise here in carebot1 model the simple and common approach is done because the public intervention with the system should also be similar

The concept of colour coded pill dispensary (figure 4) is to ease the process of input as well as output. The predefined line followed navigation is a simpler choice to eliminate the real time scenario conflict occurring with facial or voice recognizer. The heart pulse sensor and temperature sensors are an aid that could be beneficial during critical times. Carebot1 can be equipped with wearable devices (figure 5) to track and observe the designated person for any kind of anomalous behavior and inform the person in charge of the former and avoid a hazardous situation.

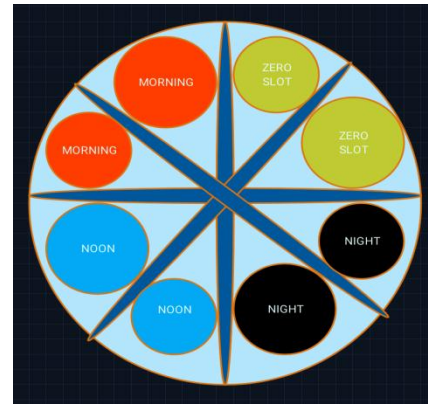


Figure 4: colour coded pill dispenser.

GSM is used to alert if skipping of medicine has occurred, through this keeping an unbreakable time slot. Also it can be used as a reminder to rebuy the medicines or take a recheck up. The tracker details could also be given via mobile, if the designated person is having memory related disorders this technique would be very useful in preventing any form of unusual behaviours. The economical status of bot comes around 6k which in terms of today industrial calculation is much cheaper and affordable.

CAREBOT1 (figure 5) is built with stack like frame to hold circuits upon a 4 wheeled base. The wirings could be slotted through each of these frames. Using arduino processors the pill dispenser as well as 4 wheel base are controlled individually, arduino nano is used to control pulse sensor and temperature sensor.

The main purpose of fingerprint sensor is used to give child protection and RTC timer is used to set the timing of pill with real time status. Colour sensors are used for line follower system. The RTC timer is incorporated with line follower system to make navigation to predefined location before 3-5 minutes before the pill intake time.

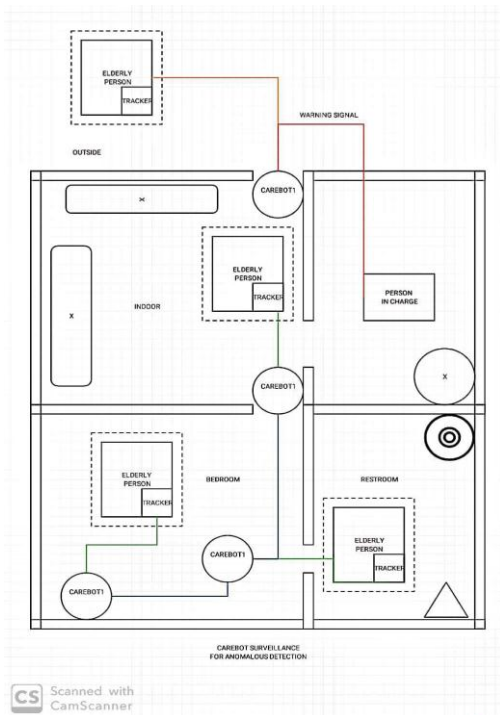


Figure 4: CAREBOT1 surveillance for anomalous behavior.

CONCLUSION

Machine for service is the important aspect we focus on to bring with Carebot idea. In this growing world where the main focus is running behind vanity common mistakes that could lead to perilous situations should be avoided. Carebot is a machine with service scalability it could be upgraded. Robotics will be a part of near future its because the rise in literacy will cause decline in human labour services at that point robotics will only be the option to compel mechanical aid to humans. Where flesh stops machine will rise.

FUTURE WORKS

As said appellation of a machine for service scalability carebot is upgradable and thus a recommended design was:

QUADRAWHEELED HYBRID CAREBOT features

- Stair Climbing(elevation mechanism).
- Better stability.
- Working mechanism: leg lift and body shift.
- 2 wheel base: 360 degree rotation.

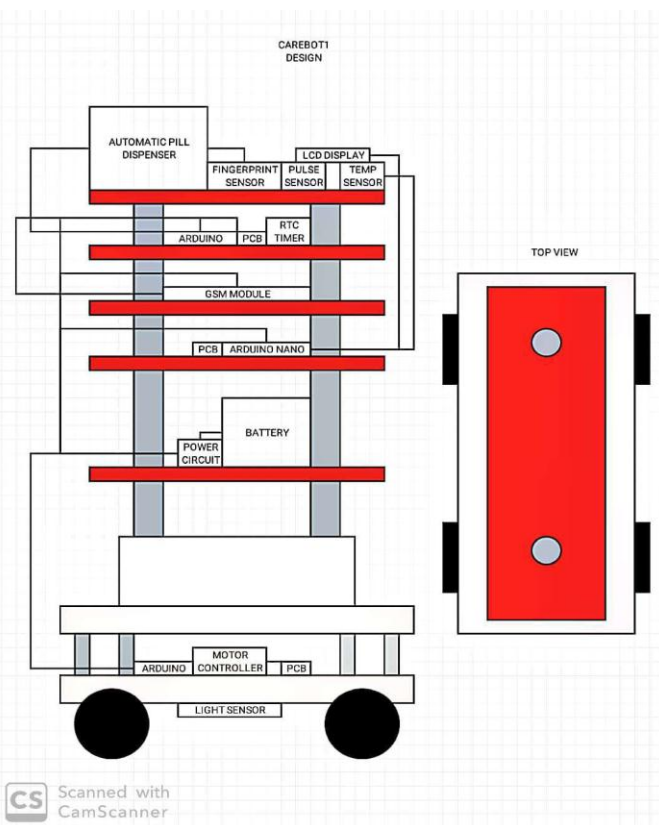


Figure 5: CAREBOT1 Design.

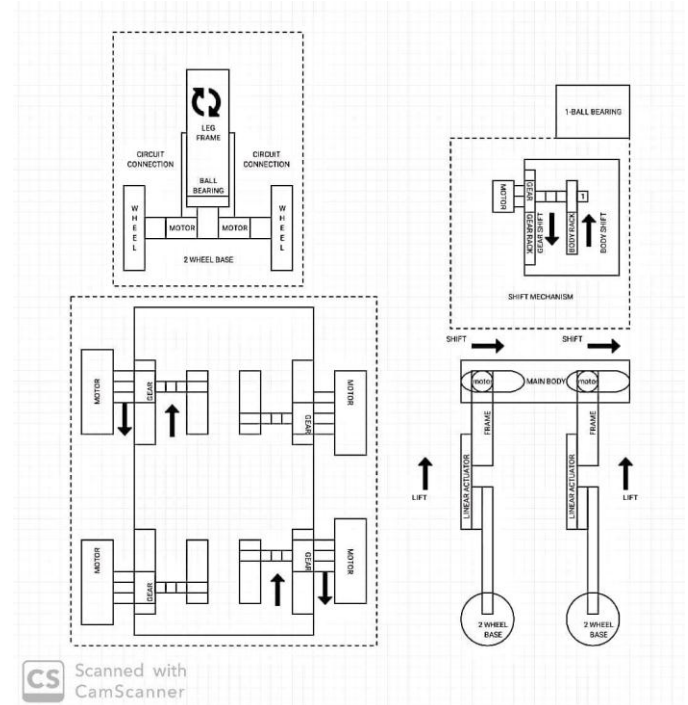


Figure 6: QuadraWheeled Hybrid Carebot

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