ROBOTIC NURSE

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Introduction:

The World Health Organization (WHO) on January 30, 2020 publicly declared the COVID-19 pandemic as a "global emergency" because of the rapidity at which it had spread worldwide. Since, the first bunch of cases identified in Wuhan City, China, in December 2019, the coronavirus pandemic has rapidly spread across China as well as over the borders. Recently, clinical data confirmed that a significant portion of the COVID-19 patients show extreme symptoms for the first four days, which illustrates the stealthy transmission potential of this contagious disease. Scientists have deliberated that COVID-19 isfar more transmittable and lethal than the ordinary flu.

According to the WHO's report published on May 26, 2020, so far, 5,404,512 confirmed cases have been reported worldwide.The death rate is highest among older people compared to young ones, while male patients are more susceptible to risk compared to female patients in the same age group.

Patients with pre-existing cardiovascular diseases/hypertension, diabetes, cancer, and chronic respiratory disease have greater probability to pass away due to covid-19 complications compared to other patients. It is of utmost importance to use hand sanitizers, face masks, and practice social distancing to avoid the viral infection, which can spread through sneezing, touching, and shaking hands.Therefore, alternate technologies involving medical robots are in focus in order to control the spread of infection to a large population.which highlights the importance of robotics in hospital and healthcare facilities specially concerned with the COVID-19 outbreak.

Objectives:

- To consider and meet the specified needs of peoples health.
- The main objective of our proposed system is to create a user friendly design that the patients can use as a remainder alert to take their daily medication on time.
- The main objective of this research work is to develop a nurse robot (NR) system which acts as a diagnostic device that is programmable, multi-function designed to help doctors and nurses performing their jobs to the fullest and help patients recovering better.
- This research is mainly aiming to solve the p problem of nurse visiting patients repeatedly many times a day by designing and implementing a prototype of a nurse robot (NR) system that is able to measure any patient multiple vital signs such as heartbeat rate, blood pressure, oxygen rate, and body temperature, with high accuracy and send all the patient informationin the report to the doctor.
- Emergency condition reading with camera option for authentication.

Methodology:

Medicine giving out is a vital procedure in a hospital ward. We implemented robot, exact time robot moves on path to perform the duty. Our nurse robot finds the path to reach to the patient. To speak to patients about medicine using voice playback device. Here controller is used as an Raspberry Pi module. Voice play back is used for the sound indication. Battery used is the lead acid battery and its operating voltage is the 12v.. LCD is used for displaying the time. DC motor is used for running the motor but it is not directly connected to the micro controller so DC motor drive is used.

Emergency switch and camera are used to check the patient conditions if any condition is critical send sms to concern doctor. Time to time medicine dispensing as per the requirements accordingly. Here we are designing robot in 2 modes automatic and manual mode. These robots are meant to assist doctors in the hospital in the same manner as that of human nurses.

Nurse robots are commonly used in Japanese hospitals as Japan has the highest percentage of elderly (above 75 years) individuals among OCED countries. This poses a growing challenge for the medical facilities in the country. Without sufficient recruitment for elderly care, more Japanese citizens are socially bound in taking care of aging family members at home instead of doing a job. In addition, the nursing and healthcare individuals undergo high stress andexhaustion due to patient load.

- In Automatic mode robot will dispense the medicine accordingly for defined path and check the condition update to blynk server.
- In Manual mode we can control the robot from mobile application according to our path
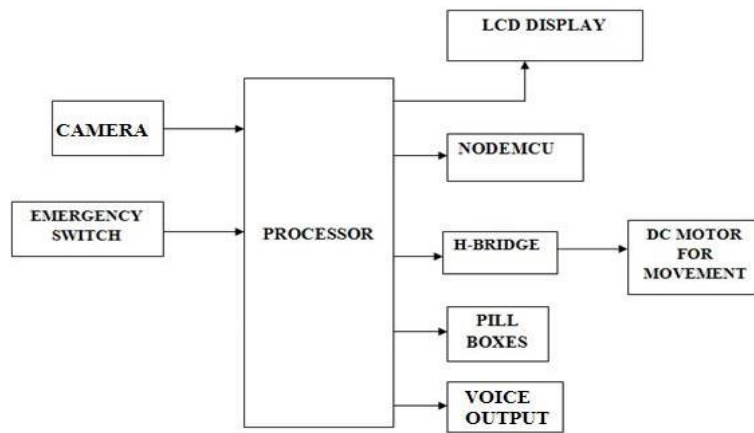
Block Diagram

Results and Conclusion

Raspberry Pi is preferred over other boards since it is the most popularly building a robot. The Nursing Robot will help the patient to take the medicine at the correct time. Based on timing, the robot will move from one place to another place. Since DC motor is used for movement of the robot, so it can move in four directions without any constraints. Our proposed system is interfaced with sensors which enhance the patient caring level in the hospital with the help of IoTtechnology.

We can implement this caring robot in the hospital for reminding the patients about their medicines without human interventions.It also sanitizes the sorroundings to protect from infection.The result of our proposed system is that the human nurse can also control the robot movement manually. The nurse robot is a replacement to human nurse for maintaining social distancing with COVID-19 patients

The nurse robot will provide medicine to the patients on specific schedule by opening the dispensers on time and also robot checks the vital signs such as body temperature,oxygen level,blood pressure,heartbeat rate and pulse rate and if an emergency condition occurs robot will send a message to doctors phone with image of patient.and by using sanitization pump robot will sanitization pump robot will protect the infection from the sorroundings.

Scope of future work

With the implementation of new technologies, the robotic machines have become more effective and affordable. Nursing robots can take on tasks like helping patients to move like handicap patients, delivering medicine acting as an interface between patient and doctor. Additionally, nursing robots will take on physical demanding work like carrying or moving people. Especially, when nursing immobile or handicapped people, the assistance of robots will be a great relief for nurses and caregivers.

Nursing robots may serve as supplemental healthcare workers in hospitals, elderly-care facilities, and at home. They can perform logistics and laborious physical tasks, combat loneliness and inactivity in the elderly population, or assigned routine tasks such as measuring patients' vital signs.

Remote-controlled telerobots can handle interactive caretaker duties and serve as interfaces for doctors and/or nurses to communicate with patients and/or the elderly over distance.Nursing robot may also provide services for telemedicine purposes. The development of non human nurses or robotic nurses will be essential to cope with the lack of human care givers in future robots will assist olders at home, in hospitals and oldage home. One of the main benefit is that they are comparably cheap labour. They have very least management cost.