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Smart Health Care Robot Using IoT

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Abstract:The smart health care system using IoT describes the evolving role of robotics in healthcare and allied areas with special concerns relating to the management and control of the spread of the novel coronavirus disease 2019 (COVID-19). The prime utilization of such robots is to minimize person-to-person contact and to ensure cleaning, sterilization and support in hospitals and similar facilities such as quarantine. It results in minimizing the life threat to medicalstaff and doctors taking an active role in the management of the COVID-19 pandemic. The intention is to highlight the importance of medical robotics in general and then to connect its utilization with the perspective of COVID-19 managementso that the hospital management can direct themselves to maximize the use of medical robots for various medical procedures. The popularity of telemedicine, which is also effective in similar situations. In essence, the recent achievement of the Korean and Chinese health sectors in obtaining active control of the COVID-19 pandemic was not possible without the use of state of the art medical technology.

Keywords: *Channel GAN, CNN, end-to-end communication system, channel coding.*

I. 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. The virus has shaken worldwide economies leading to a stock market crash in many countries. 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, causing multiple incidents in nearly all countries of the world except Antarctica as shown. Despite the scarcity of publicly available data, scientists around the world have made progress in estimating the scale of the pandemic, the progression rate, and various transmission patterns of the disease. Recently, clinical data confirmed that a significant portion of the COVID-19 patients show diminutive symptoms for the first four days, which illustrates the stealthy transmission potential of this contagious disease. Scientists have deliberated that COVID-19 is far more transmittable and lethal than the ordinary flu.

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 patients without comorbid conditions. United States, China, Italy, Iran, Brazil, France, U.K, and Germany are so far the most affected countries of the world.

II. LITERATURE REVIEW

Mahmoud Nasr proposes the use of Smart Health Care in the age of AI ; Recent advanced, challenges , and future prospects [1]. Daniel Hernandez Garcia proposes the use of Social Robots in Therapy and Care [2]. Aamir ahamed proposes the use of an Design and Use of Implementation of Nurse Robot for Old or Paralyzed person [3]. P Manikandan et.al proposes the use Smart Nursing Robot for Covid 19 Patients [4].Alexander Valiton et.al proposes the use of Active telepresence Assistance for Supervisor Control [5]. Metin Berke Yelaldi et.al proposes Fuzzy- Based Health Monitoring and Voice Assistance featured Autonomous Elderly care Service Robot to [6]. R Devi et.al proposes A Socially Assistive Robot for Covid 19 screening in long term care in house

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III. METHODOLOGY

Fig -1 shows the Block diagram of the proposed methodology. The main components of the block diagram are the processor Arduino mega and nodemcu

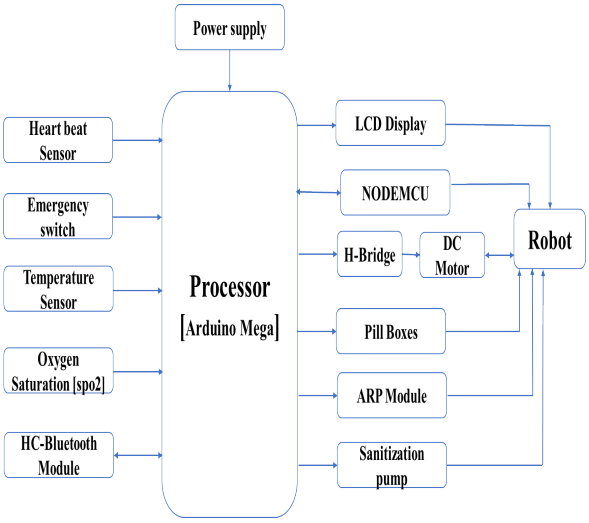

Fig1: Block Diagram of proposed methodology

The proposed architecture of smart health care robot using IoT provides an overview of the existing nursing robots and introduce their classification, characteristics and development, this paper reviews various productions and patents related to the nursing robot.

IV. Flow of the System

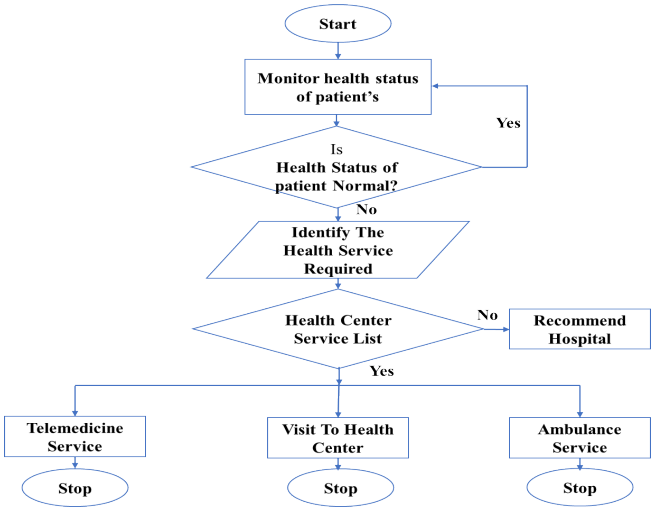

Fig 2: Flow chart of Patient health monitoring system

1. The robot at remote site has pulse rate sensor, temperature sensor, all capturing information and stores it in the database.

2. When the doctor needs the information, they can obtain form the database.

3. In case of emergency the robot will alert the doctor about patient's condition.

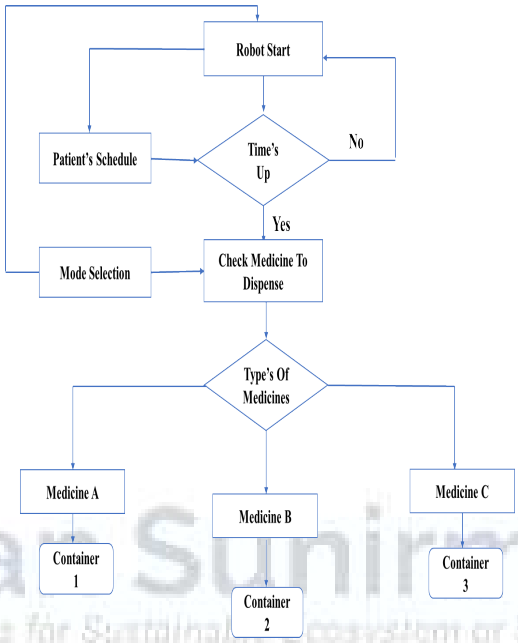

Fig 3 : Flowchart of automatic medicine dispenser

1. Pills dispenser pair high-tech advances with a easy to-use dispenser.

2. The medications are loaded into the dispenser, and each dose is dispensed according to a present schedule.

3. An audio remainder sounds to notify the patient that it is time to take the pills.

4. These systems can accommodate up to 3 separate medication times each day, depending on patient's needs.

The major components of this medication dispenser are a microcontroller interfaced with an alphanumeric keypad, an LED display, a Motor Controller, an Alarm system, a multiple pill container and dispenser.

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One of the tasks is an automatic medicine dispenser. It is necessary to provide medication to the aged in time. Automatic medication dispenser is designed specifically for users who take medications without close professional supervision as shown in Figure 3 It relieves the user of the error prone tasks of administering wrong medicine at wrongtime.

V. RESULTS

A smart healthcare robot that uses IoT technology can be designed to include temperature sensors that monitor the temperature of the patient. The robot can then display the temperature condition of the patient on an LCD display.

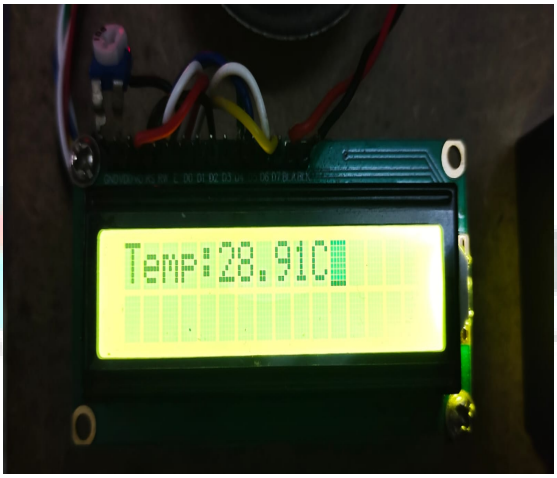


Fig 4 Display of temperature on LCD

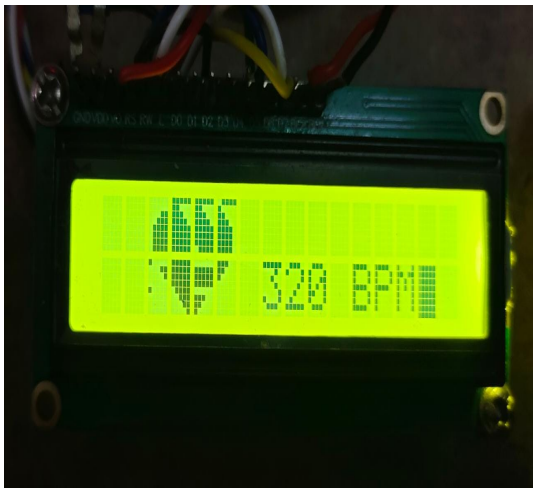


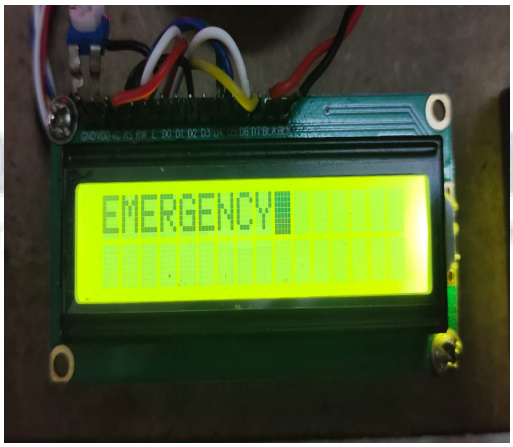
Fig 5: Display of heartbeat(bpm) on LCD

Fig -4 A smart healthcare robot that uses IoT technology can be designed to include temperature sensors that monitor the temperature of the patient. The robot can then display the temperature condition of the patient on an LCD display.

Fig -5 A smart healthcare robot that uses IoT technology can be designed to include temperature sensors that monitor the temperature of the patient. The robot can then display the temperature condition an LCD display.

The temperature reading from the sensors can be transmitted wirelessly through the internet to a cloud-based platform or a local server where the data can be analyzed and processed.

Fig 6 :Display of Emergency on LCD



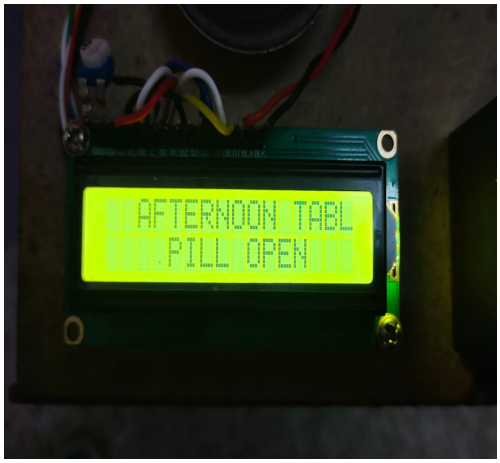


Fig 7 :Display of pill box open on LCD

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Fig -6 In an emergency situation involving a smart healthcare robot that utilizes IoT (Internet of Things) technology, several steps can be taken to ensure the safety and well-being of the patient and those in the vicinity.

Here are some possible actions that can be taken:
Identify the emergency: The first step is to quickly identify the type of emergency, such as a fall, a sudden change in vital signs, or an unexpected event. The smart healthcare robot should be programmed to detect such emergencies and alert the healthcare provider immediately.
Alert the healthcare provider: Once the emergency has been identified, the smart healthcare robot should immediately send an alert to the healthcare provider, either via email, text message, or phone call. The alert should include details of the emergency, such as the patient's location and vital signs.

Fig -7 The result showing morning, afternoon, and night tablet pills open in the LCD display of a smart healthcare robot using IoT can be a valuable feature for managing medication adherence in patients.

The information could be transmitted in real-time to healthcare providers, caregivers, or family members, enabling them to monitor the patient's medication compliance and intervene if necessary.

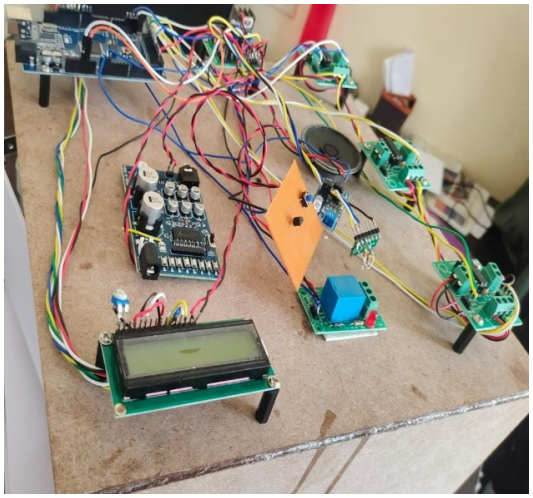

Fig 8

VI. CONCLUSIONS

The smart health care robot using IoT, mainly focused on designing and developing of medical assistant robot **"Smart Health Care Robot Using IoT"** as primary patient monitoring and patient caring assistance with daily activities. For user friendly the robot is designed with the manual and autonomous control system. Doctors from anywhere in the world will be able to show the patients data without touching the patient through the IoT system and make communicate video calls with the patient. This type of robots will go a long way in alleviating the lack of adequate doctors in medical services around the world. Anyone who knows primary operating can also use this robot as a medical assistant in the family. Machine learning and AI system will be carried through in the future.
due to normal activities (such as sneezing), can be reduced by improving the change in places detection method.

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