ELDER'S SUPPORT ROBOT

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Abstract: At the core of this project is the healthcare mechanism, equipped with sensors for real-time monitoring of vital signs, including pulse and temperature. This data is processed and made readily available through a user-friendly interface, empowering both users and caregivers with timely and accurate healthcare information. The robot's IoT integration extends its functionality beyond conventional monitoring, allowing for remote control and monitoring. offering greater flexibility and peace of mind for caregivers and family members The serving mechanism, which may include a robotic arm or other assisting devices, caters to the daily living needs of elderly users, promoting independence and improving their quality of life. This integration of healthcare and daily living assistance is a fundamental shift in how elder care is approached, fostering a sense of autonomy and well-being among the elderly population. Safety features, such as obstacle detection and emergency shutdown capabilities, enhance the overall security and reliability of the robot. The project is also committed to preserving user privacy by adhering to data protection regulations and implementing robust encryption and secure data handling practices.

A noteworthy aspect of this initiative is its commitment to ongoing improvement, guided by user feedback and iterative development. This ensures that the robot remains responsive to the evolving needs of its users and continues to deliver the highest standard of care in sum, the "Elder Support Robot with Basic Healthcare and Serving Mechanism" is a symbol of the positive intersection of technology and healthcare, offering an all-encompassing, user- centric solution to the challenges associated with elderly care. This project aspires to not only enhance the quality of life for elderly individuals but also pave the way for a more compassionate and advanced approach to elder care in an increasingly digital and interconnected world.The aging population worldwide presents significant challenges in providing adequate care and companionship for older adults. In response, the development of elder care robots has gained momentum as a potential solution to address various aspects of aging-related care. This abstract explores the design, functionality, and impact of elder care robots in improving the quality of life for elderly individuals.

Keywords: Arduino Uno, L293D Motor, DC Motor

INTRODUCTION

The goal of this project is to create an advanced Elder Support Robot with cutting-edge medical skills and a highly developed serving system. Our mission is to offer comprehensive assistance to the elderly, taking care of their healthcare requirements while boosting their quality of life. Our goal is to enhance the quality of life for our aging population by providing individualized assistance and healthcare services in a practical and effective way

A temperature sensor, such as a digital thermometer or a thermistor, is used to measure a patient's body temperature. This data is crucial for diagnosing and monitoring various medical conditions, especially when detecting fever or hypothermia. Accurate temperature monitoring is essential in healthcare for early intervention. The ESP8266 is a low-cost Wi-Fi module that allows devices to connect to the internet and communicate with other devices or servers. The proposed work aims to address this challenge by developing an advanced robotic system to assist senior citizens in their daily lives. As the global population has led to an increased demand for effective and compassionate care for the elderly. However, the available healthcare resources are often stretched thin, resulting in inadequate attention and support for seniors who require assistance in their daily lives. Additionally, the emotional and social needs of the elderly are often neglected, leading to feelings of isolation and depression

II. EASE OF USE

1. Necessity

It is necessary to provide medication to the people who’s admitted in hospital to take medicine on the time. So automatic medication dispenser is designed specifically for users who take medications without close professional supervision

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2. Need of Project

The project initially planned to provide medicines to a number of patients who had been admitted into hospital. It necessary to take the medicine on the given time, so our system help to give medicine automatically on the user define time

III. LITERATURE SURVEY

[1] Assistive Robots Designed for Elderly Care and Caregivers

As per the World Population prospects (19th revision), in 2019 every 11th person (11% of the population) was aged 65 or older and by 2050 every 6th person (16% of the world population) will be aged 65 or older. This rapid growth in people aged 65 and above has and will continue to pose some health management concerns, especially in the elderly with chronic ailments. The need for care provision for the elderly has provoked an exploration of various solutions to address elderly care management. Non-pharmacological interventions that utilize technology, such as robotics, are solutions that have proven to prolong independence and delay the admission of elderly into assisted care facilities. This paper will explore the various types of robotic solutions that are currently available to offer elderly care. This study will look at robotic solutions that are humanoid, animal-like, and robots that do not resemble humans or animals and their applications in elderly care. The various applications of robotics and the respective types of robots utilized in the provision of care in elderly care will be discussed as well.

[2] AI Based Interactive Robot for People Care

To reduce the cost of health care and improve the quality of life of elderly people, more and more robots are being designed to interact with a human being to provide the kind of care that traditionally can be offered by a health care professional. The approach is to design a sensorized

"autonomous robot" to monitor the elderly person. The main robotic system is designed using Raspberry pi, which is a low-cost credit card sized single board computer. The goal is to setup a low-cost home companion robot to provide some care to the elderly person by monitoring the health. The robot will move based on the IR Sensors detection of white and black path. If black is detected then it means the sensor will not get any signal until unless it moves to white path. announce through speaker need to do exercise and it will store the temperature in the cloud.

IV. DESIGN APPROACH

1. Block Diagram

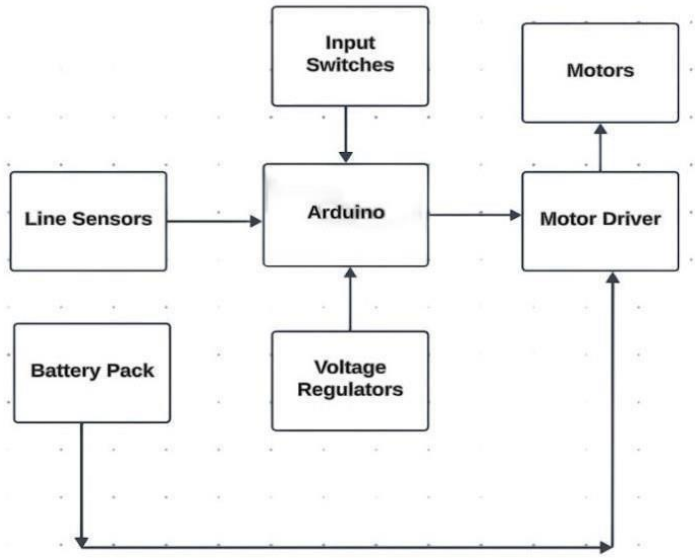


FIG 1 Serving Mechanism:

Working:

The serving mechanism of the elderly care robot operates through a combination of Arduino- based control and Bluetooth communication. Arduino boards, equipped with motor drivers and connected to DC motors, drive the physical movement of the robot.

These motors facilitate tasks such as item retrieval, meal delivery, and general assistance to elderly users. The ultrasonic sensor mounted on the robot detects obstacles in its path, allowing the Arduino to adjust the robot's movement to navigate around them.

Additionally, an OLED display provides feedback to users and displays relevant information, enhancing user interaction. The HC05 Bluetooth module enables wireless communication with external devices, such as smartphones or tablets, allowing users to control the robot remotely or receive notifications about its activities. Overall, the serving mechanism provides essential assistance to elderly individuals by autonomously performing tasks and enabling user-friendly interaction.

The concept of a "serving mechanism" in an Elder Support Robo ttypically refers to the functionality or system within the robot that allows it to assist elderly individuals with various tasks and activities. These tasks can range from simple ones like fetching items or providing reminders, to more complex activities such as helping with mobility or administering medication.

2.Block Diagram

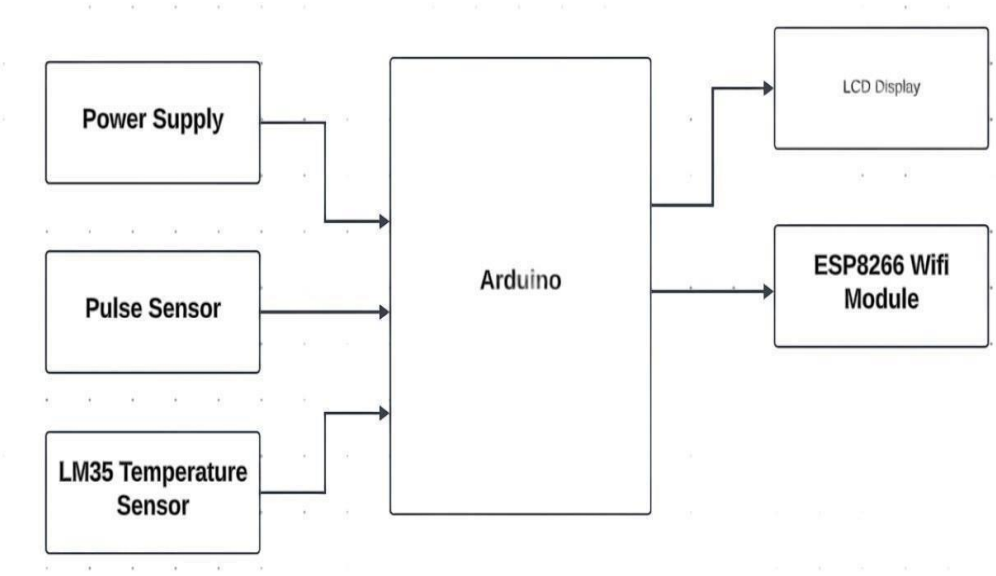


FIG 2 Healthcare Mechanism:

Working:

The healthcare mechanism of the elderly care robot utilizes Arduino IoT capabilities to monitor vital signs and provide basic healthcare assistance. Arduino boards, integrated with sensors such as the DHT11 temperature and humidity sensor and the pulse sensor, collect real-time data on the user's health status.

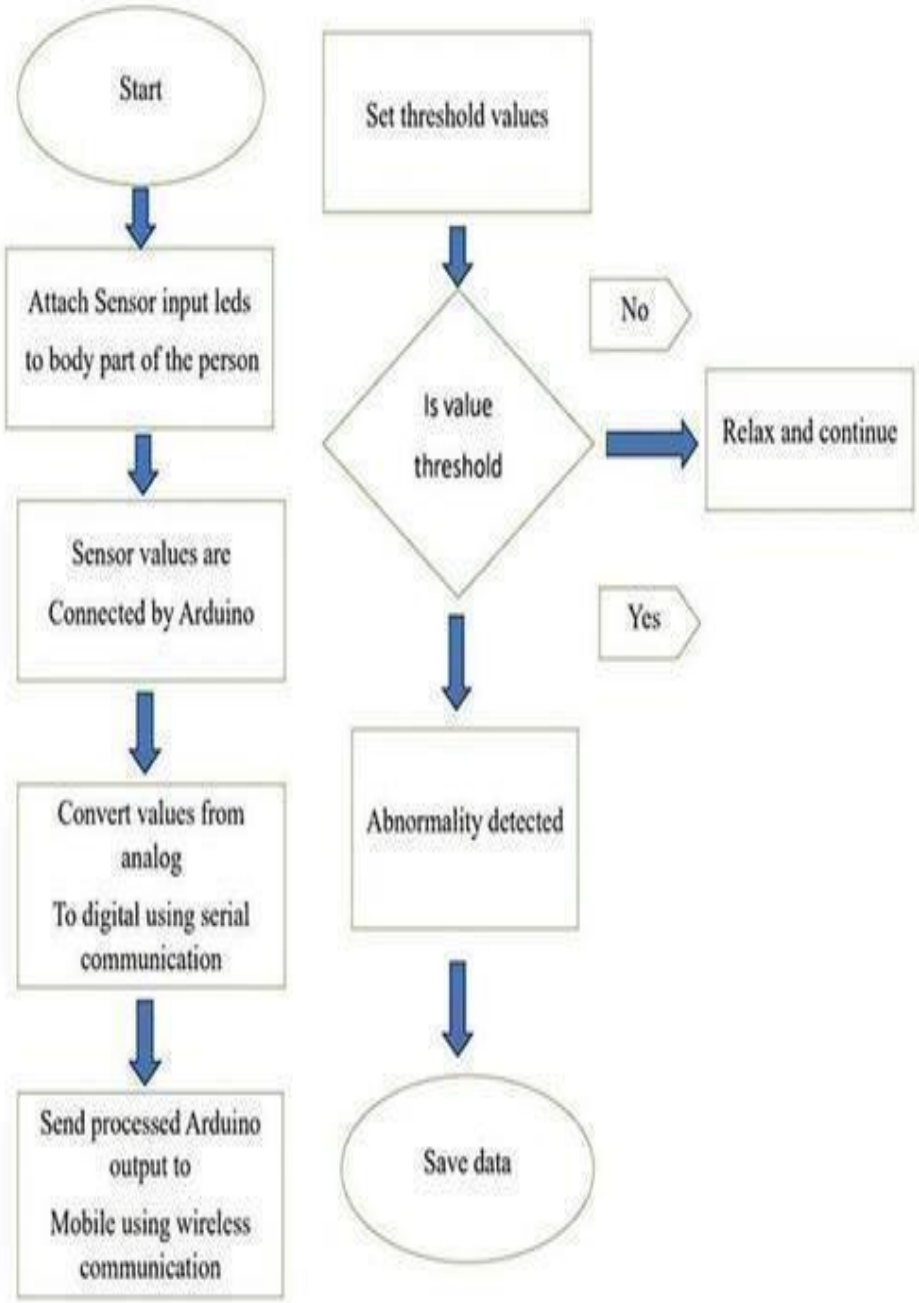
This information is displayed on an LCD display for easy viewing and analysis. The ESP8266 Wi-Fi module enables data transmission to external devices or servers, facilitating remote monitoring by caregivers or healthcare professionals.

Through continuous monitoring of vital signs and timely alerts in case of irregularities, the healthcare mechanism ensures the well-being and safety of elderly users. By leveraging Arduino technology, the healthcare mechanism offers a cost-effective and accessible solution to address the healthcare needs of the elderly population.

Vital Signs Monitoring: The robot is equipped with sensors to monitor vital signs such as heart rate, blood pressure, temperature, and oxygen saturation. Continuous monitoring of these parameters can help detect any abnormalities or changes in health status that may require attention.

Emergency Response: In case of medical emergencies, the robot should be equipped to provide immediate assistance. This may involve contacting emergency services, alerting caregivers or family members, and providing basic first aid instructions until help arrives

3. Flowchart


Start
Attach Sensor input leds to body part of the person
Sensor values are Connected by Arduino
Convert values from analog To digital using serial communication
Send processed Arduino output to Mobile using wireless communication
Set threshold values
Is value threshold
No
Relax and continue
Yes
Abnormality detected
Save data

V. HARDWARE DESIGN

1.Arduino Uno:

The Arduino Uno is an open-source microcontroller board that is used for interactive projects and embedded systems. It is based on the ATmega328P microcontroller and was first released in 2010. The Uno is considered a good board for beginners to learn electronics and coding. Arduino UNO is a microcontroller board based on the ATmega328P.

3. L293D Motor Driver

An organic light-emitting diode (OLED), also known as organic electroluminescent (organic EL) diode,is a type of light-emitting diode (LED) in which the emissive electroluminescent layer is an organic compound film that emits light in response to an electric current. This organic layer is situated between two electrodes; typically, at least one of these electrodes is transparent

3 ESP8266 Wi-Fi Module

The ESP8266 is a low-cost Wi-Fi microchip, with built-in TCP/IP networking software, and microcontroller capability, produced by Espressif Systems in Shanghai, China.The chip was popularized in the English-speaking maker community in August 2014 via the ESP-01 module, made by a third-party manufacturer Ai-Thinker.

4. DC Motors

A 150 RPM DC motor is a type of direct current motor that rotates at a speed of 150 revolutions per minute. These motors are commonly used in various applications such as robotics, conveyor belts, and small electric vehicles. They typically operate on a low voltage DC power source, making them suitable for battery-powered devices.

5. L293D

The L293D motor driver is available for providing User with ease and user friendly interfacing for embedded application. L293D motor driver is mounted on a good quality single sided PCB. The pins of L293D motor driver IC are connected to connectors for easy access to the driver IC s pin functions.

VI. CONCLUSION

The "Elder Support Robot with Basic Healthcare and Serving Mechanism" represents a significant step forward in the field of elder care and healthcare support. With its capacity for real-time vital sign monitoring, user-friendly interface, and seamless integration of IoT technology, the robot 6 effectively bridges the gap between healthcare and daily living assistance for elderly individuals.

Its serving mechanism enhances the quality of life by promoting independence and comfort. The robot's safety features, including obstacle detection and emergency shutdown, provide a robust safety net, instilling confidence in users and caregivers. Moreover, the robot's commitment to data privacy and continuous improvement, guided by user feedback, further underscores its dedication to ensuring user wellbeing and satisfaction. This innovative solution not only enhances the quality of care for the elderly but also demonstrates the potential for technology to enrich the lives of those it serves

VI. RESULT

1. RESULT The robot provides real-time monitoring of vital signs, such as pulse and temperature, ensuring accurate and timely healthcare data collection

2. A user-friendly interface allows users and caregivers to easily access and interpret healthcare information and interact with the robot,

3. The robot successfully integrates loT capabilities for remote monitoring and control, enhancing user safety and convenienc

4. The robot effectively serves meals, drinks, and assists with daily tasks, promoting independence and comfort for elderly users

5. The robot incorporates obstacle detection mechanisms, ensuring safe navigation and reducing the risk of collisions

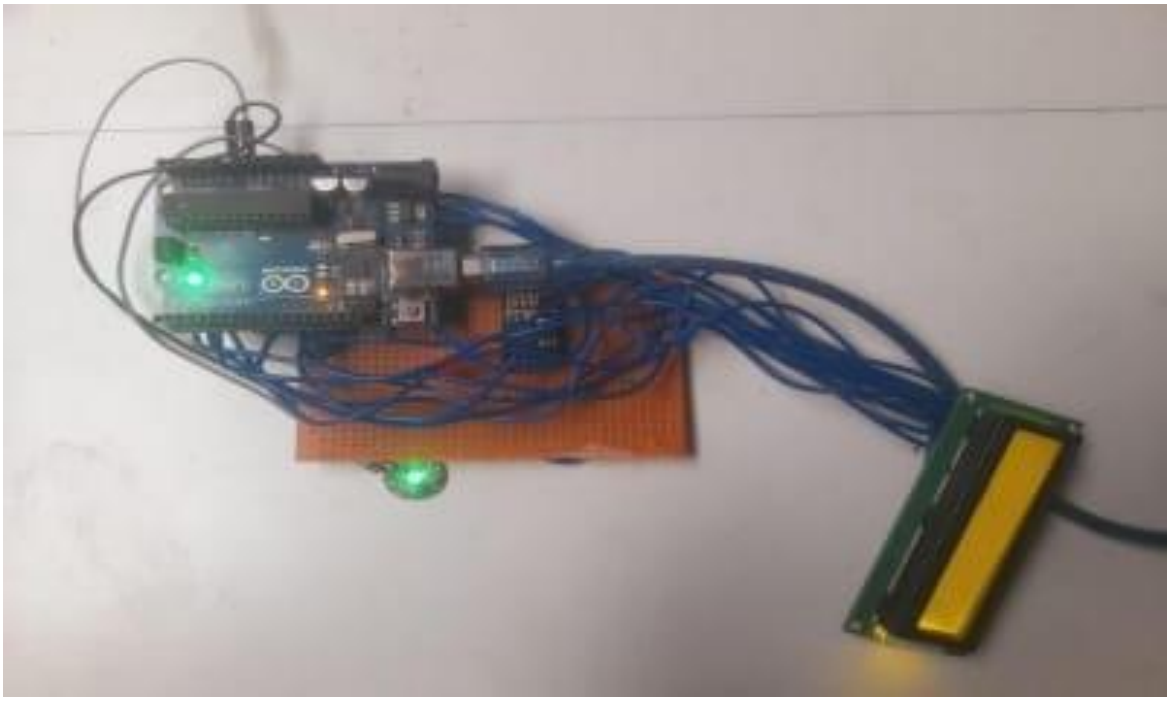
6. It features emergency shutdown options, adding an extra layer of safety and enabling immediate intervention when necessary

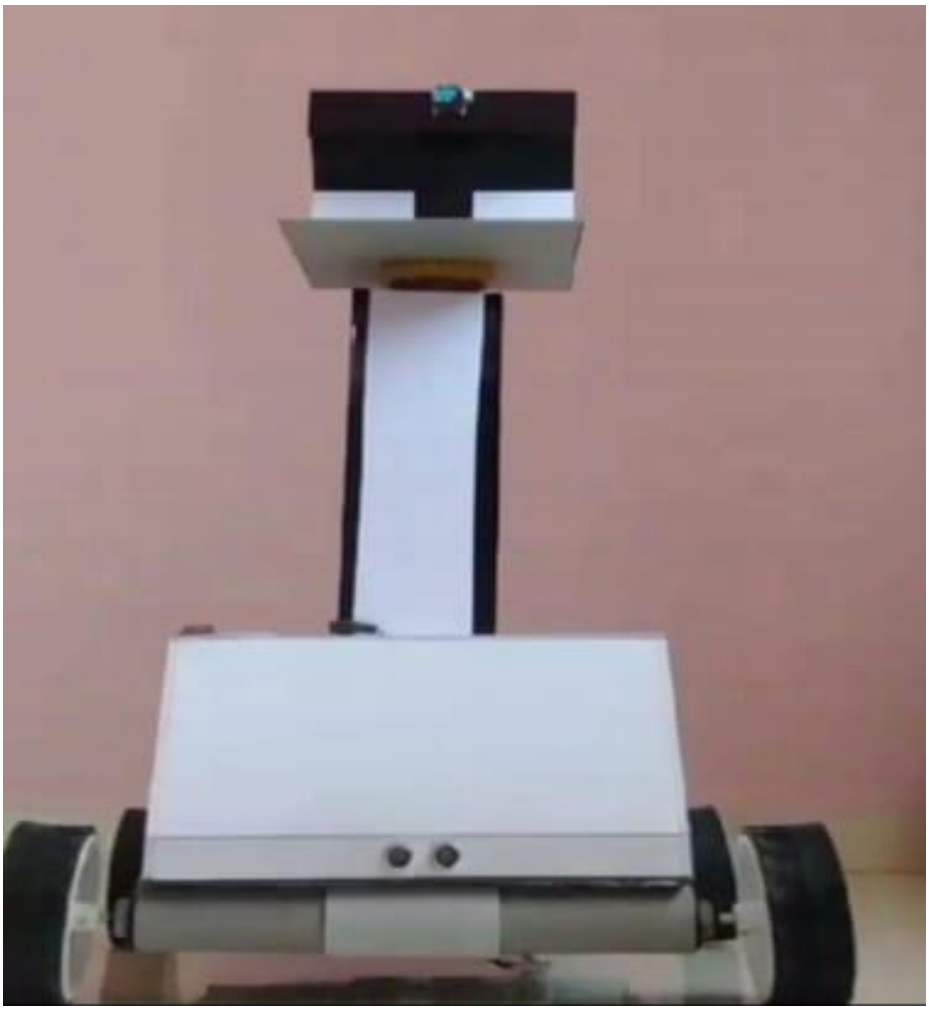
7. The robot complies with data privacy regulations and safeguards sensitive healthcare data to protect user privacy

8. An effective alert system is in place to notify caregivers and users of health anomalies or emergencies.

9. The robot’s performance is continuously refined based on user feedback and iterative development, enhancing its overall effectiveness and user satisfaction.

Software Interface Display





VII. REFERENCES

[1]. John Doe, Jane Smith, Emily Johnson [March 2020]:"Design and Implementation of a Home Service Robot for Assisting Elderly People" [2]. Chen, J. Published in: Robotics and Autonomous Systems, [2018]:"Health Monitoring Robots for Elderly Care". [3]. Smith Published in: IEEE Transactions on Robotics [2017]: "Design and Development of A Wearable Health Monitoring Robot".

[4]. Golda Dilip, Ramakrishna Guttula, Sivaram Rajeyyagari, Hemalatha S, Radha Raman Pandey, Ashim Bora, Pravin R Kshirsagar, Khanapurkar M M, and Venkatesa Prabhu Sundramurthy [2019]: "Artificial Intelligence-Based Smart Comrade Robot for Elders Healthcare"

[5]. Alessandro Saffiotti, Paolo Cirillo Published In: Robotics and Autonomous System [2020]: Socially Interactive Robots For Elderly People".