



INTELLIGENT SERVICE ROBOT

Sathya S.N¹, Abinaya Devi D², Keerthana V.A³, Priya Dharshini S⁴
Shibia J⁵, Ruthra Kumar V⁶

¹Associate Professor, ² Student

^{1,2,3,4,5,6}Department of Electrical and Electronics Engineering, Kathir College of Engineering, Coimbatore,

Abstract: Recently, there has been an need to improve the use of robotics in medical fields , to enhance the patient care. Though there are more advancements in technology still the patients informations are in paper form . This can lead to errors in obtaining informations and also leads to misdiagnosis. So this project is mainly used for viewing patients details , food habits, prescriptions. For better improvement , robot is being used. This is very interactive with the patient and doctors for providing the information. The technology of Voice Recognition is used in this project for the interaction. The informations feeded to the robot can be obtained by the doctor. As it locomotive there would be no risk for the physically challenged people. The robot is also designed to indicate the patients to consume medicines, food at the respective times. It can also kept as a home nurse for the regular monitoring of the disabled people.

Keywords: medical prescription, food habits, informations.

I. INTRODUCTION

Nowadays, Robotics playing vital role in all departments. Likewise in our project we making that to apply in Medical Application. The main aim of our project is to avoid the confusion among the doctors and nurses while having patients informations in their memory. The details of patients, prescription, food habits are being stored in the robot's memory unit. The important software that we using in this project is Arduino Mega Microcontroller 2560 .The computer accepts the program by running in IDE. The controller works based upon the program fused to it. The stored information are retrieved through voice output as an interactive mode. So for this mode we are using Voice Recognition Module. This module could recognize your voice. It can support up to 80 voice commands. In that, 7 voice command can be work at the same time. It receives the configuration command corresponds to SPI. Its being interfaced in that Arduino kit.

The food habits and medical prescriptions of the patients are stored according to the respective time. Here, the time is being maintained by Real Time Clock. It communicates with the controller through a serial interface. The RTC provides seconds, minutes, hours, day, date, month, year. And the robot is designed to be locomotive, it has been supported by four wheels coupled with dc motor for its motion control. The speed and direction of the motors are controlled by H bridge controller. The motion provided by the wheels are automated. Hence, they are again connected with the IR sensors, for the detection of obstacles in the path in which the robot moves. If there is any obstacle is found in that path ,the robot will automatically change its direction of the path. The motion of the robot comprises of two direction one in forward and other in backward.

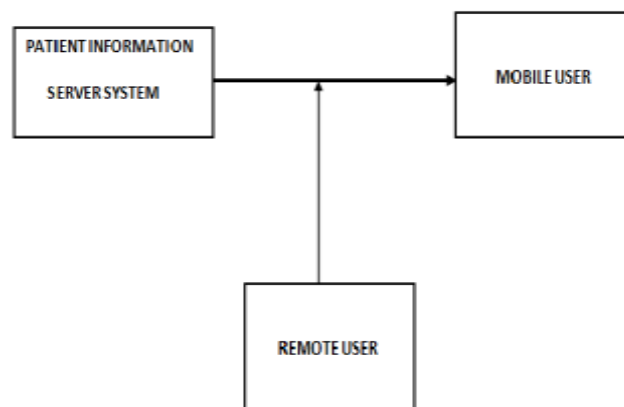
The two wheels are controlled by a set of motor and another two are controlled by another set. The memory unit plays a vital role in storing the data that we want to feed in the robot. The robot would stay with the patient for 24X7 and honorably answer the questions. Its major thing is to avoid the confusion and risk among the nurses from guiding the patients. The patients day to day food habits, pills consuming actions are being updated to the robot through the voice commands. The

output units are amplifier and speaker. The sound recorded to the unit is in the wave format. They are again amplified by the amplifier. The interactive voice output can be obtained from the speaker.

II. EXISTING SYSTEM

Earlier project provides the patients informations like ECG reports and medical prescriptions which are feeded in the computer is being interfaced with the android mobile. The doctor would be given with unique ID and password. If the doctor is signed in with the his relevant ID, he can get the information of the particular patients under his care. As this system is wireless, he can access it from anywhere. Its not necessary for the doctor to monitor the patient regularly. All functionalities provided in our system will be bounded to each other with the help of software interfaces. The system as a whole will be realized by user with the help of user interface. Thus it is nothing but connecting link between our well bounded system and its user.

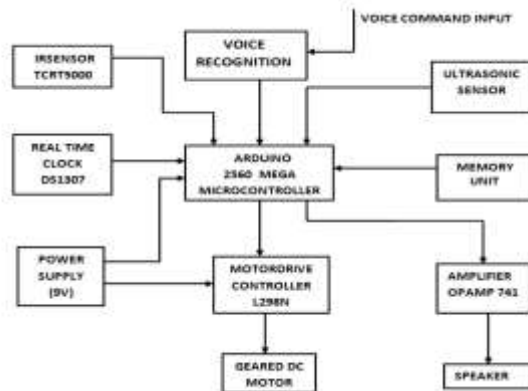
III. BLOCK DIAGRAM



IV PROPOSED SYSTEM

Using of Arduino will eliminate such disadvantages of existing unit .It uses Arduino's memory unit for storing the information as a voice command instead of storing it in computer. The informations can simply retrieved as a voice output with the help Voice Recognition Module (V3). As the output is in voice format, it is easy for the user to obtain than reading. The robot can move automatically with the help of IR sensor and Ultrasonic sensor. The robot is locomotive. It has two set of dc motor which are completely controlled by the H-bridge controller.This auto motive system helps the disabled person to interface with them in a comfort way by moving anywhere. The system also having servo motor which are acting as eyes to the robot. The motion of those eyes indicating that it is listening to the user.

The informations are stored in the Storage Device which is interfaced with the kit through the sdcard module. It also comprises of amplifier and speaker which gives a clear ouput voice is audible. And the power supply given to the system is very low when compared with the earlier system. Arising of technical problems are completely minimized as they are having direct interfacing with the output kit.



V. OPERATION

The system is supplied with a power supply of 9v. then it check automatically whether the modules are interfaced properly or not. In this interfacing section , there are three groups. In the first group, the system will be in start mode. In this mode user can turn on or off the motor and also the speaker can be made enable or disable. In the group 2, change command is given. When the command is accepted, the system will change its mode to group 2. The patient details, food habits, medical prescriptions are being delivered by the robot which are already feeded in the memory unit. In group 3, the motor forward and reverse directions are controlled by accepting the signals from the controller that we given as a voice command.

After these group commencement, the robot will start to interact. By indicating the time, the robot will ask the user to consume pill for the interval of 20 seconds until he feed his completion details into that. So the robot will maintain complete database of the patients. This interaction is very much easier for the doctors to access the information and status of the patients regularly. The system is designed to be locomoted automatically by tracking its path with the help of Infra Red and Ultrasonic sensor.

The time is indicated with the help of Real Time Clock. The motor drive controller controls the wheels coupled to the DC motor. The voice commands are being updated by Voice Recognition module. The memory unit for the kit is completely provided by SD card.

VI HARDWARE RESULT

The hardware results for the intelligent service robot are shown below in the respective blocks.

Figure 1: System In Off Mode

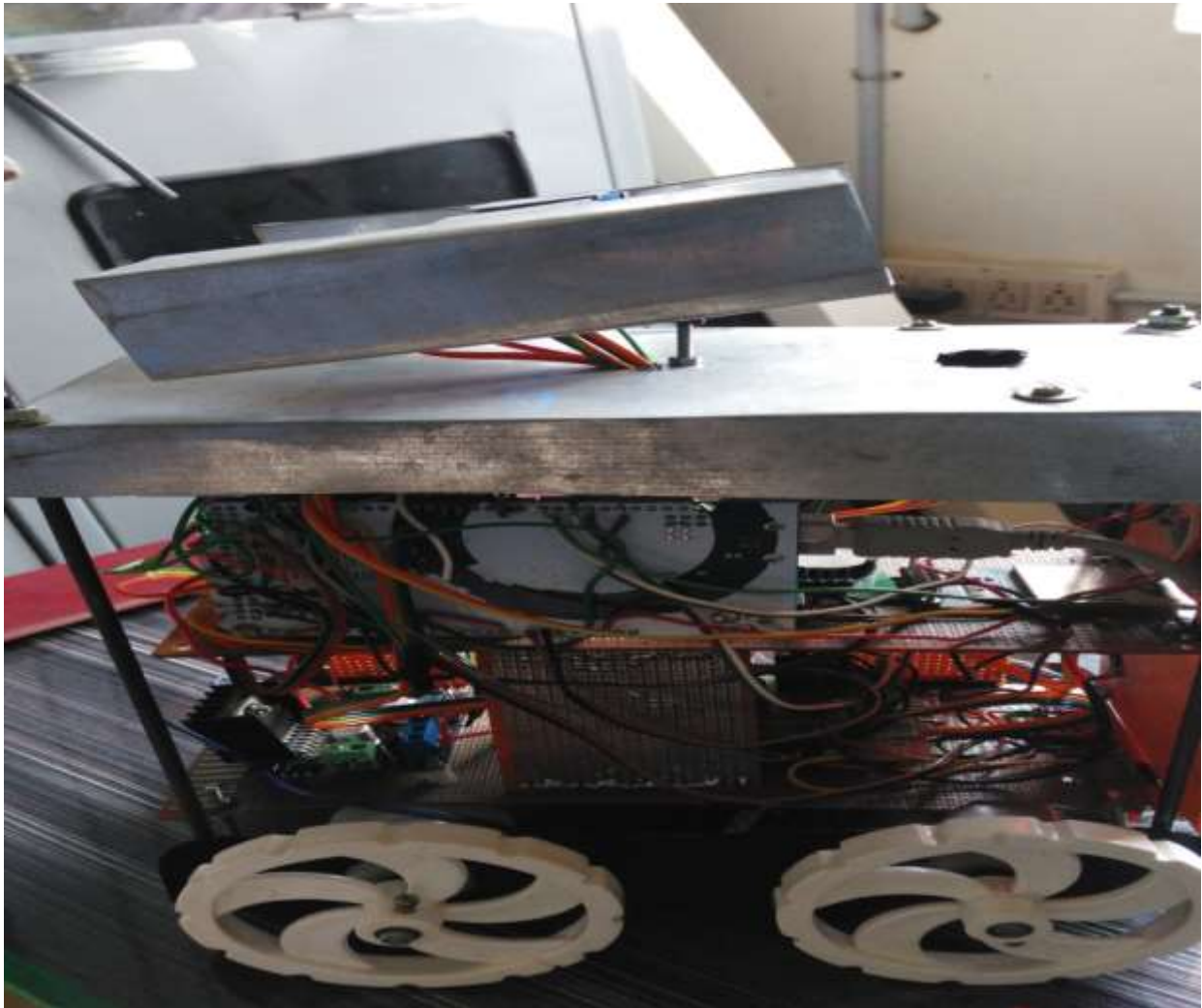


Figure 2: System In On Mode

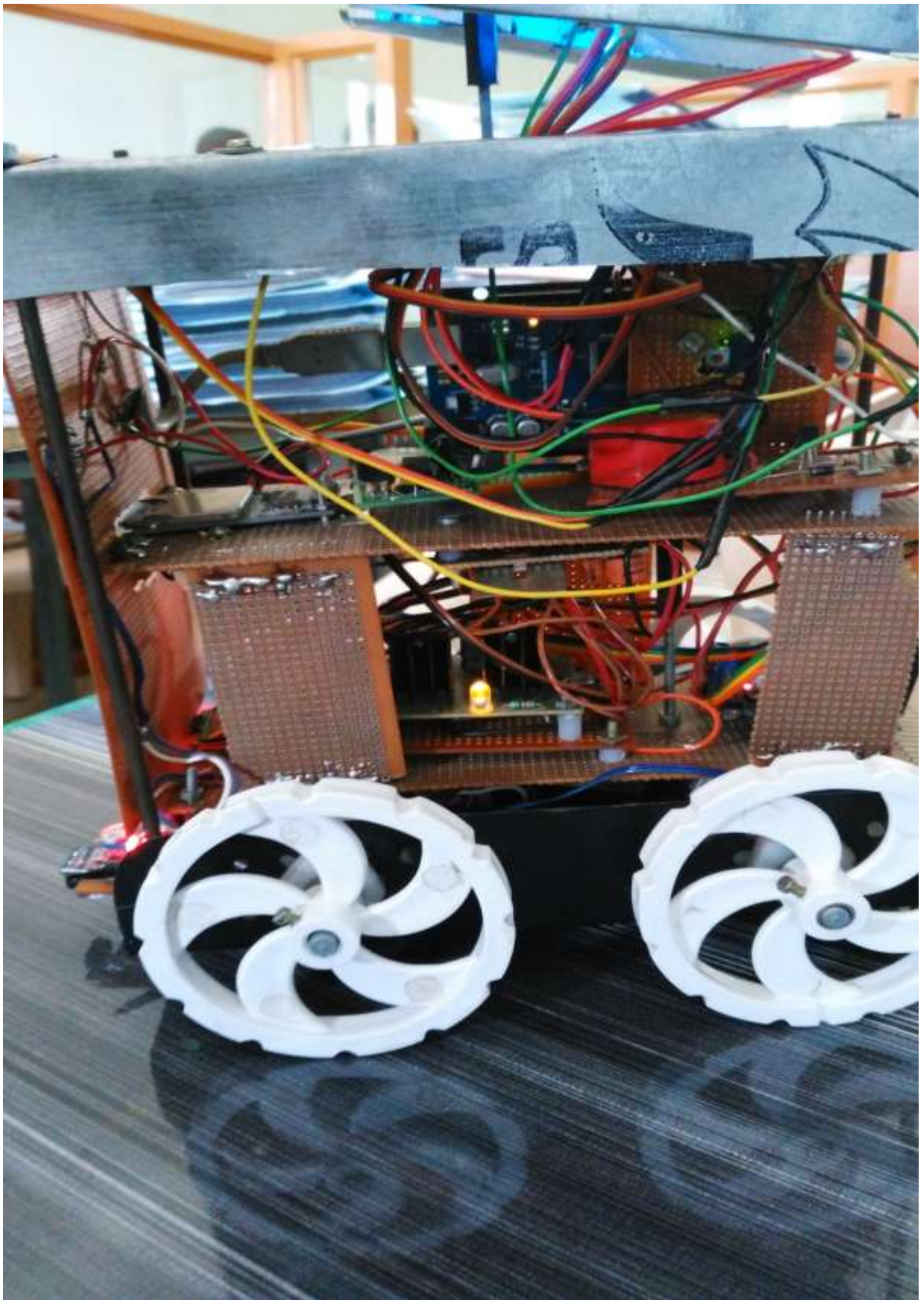


Figure3: System In Start Mode



VII CONCLUSION

The intelligent robot system is designed with user friendly environment, risking the monitoring of human in 24X7 ,minimal cost than the other system in robotics. The voice recognition is the heart of the system used in this project. It plays a major role in interaction. The indication can be made advance by auto telling with the help of sensors.The future scope of the system is by providing face recognition.

REFERENCE

1. “Wireless Interactive System for Patient Healthcare Monitoring using Android Mobile”, International Journal of Advanced Research in Computer and Communication Engineering.
2. Aiken L. H, Clarke S. P, Sloane D. M, Sochalski J, and Silber J. H (2002), The Journal of the American Medical Association, Hospital Nurse Staffing and Patient Mortality, Nurse Burnout, and Job Dissatisfaction vol. 288, no. 16, , pp. 1987-1993.
3. Goulding M. R, Rogers M. E., and Smith S. M.(2003), The Journal of the American Medical Association, Public Health and Aging: Trends in Aging - United States and Worldwide Vol. 289, no. 11, , pp. 1371-1373.
4. P. I. Buerhaus, D. O. Staiger, and D. I. Auerbach, Implications of an Aging Registered Nurse Workforce, The Journal of the American Medical Association, vol. 283, no. 22, 2000, pp. 2948-2954.
5. Spetz J, and Given R(2003) The Future Of The Nurse Shortage: Will Wage Increases Close The Gap, Health Affairs, vol. 22, no. 6, pp. 199-206.

6. Needleman J, and Buerhaus P,(2003) Nurse staffing and patient safety: current knowledge and implications for action, *International Journal for Quality in Health Care*, vol. 15, no. 4, ,pp. 275-277
7. Hillman. M, (April 2003) Rehabilitation robotics from past to present - a historical perspective, in *Proceedings of the International Conference of Rehabilitation Robotics 2003*, Kaist, Daejeon, Korea, pp. 1-4.
8. Van der Loos, Hammel J, Leifer L J, DeVAR(1994) transfer from R&D to vocational and educational settings, in *Proceedings of the Fourth International Conference on Rehabilitation Robotics*, Wilmington, Delaware, June 1994, pp. 151-156.