iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 9 **Issue:** VII **Month of publication:** July 2021

DOI: https://doi.org/10.22214/ijraset.2021.36646

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 9 Issue VII July 2021- Available at www.ijraset.com

Research Progress on Robotic Nurse

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Abstract: ***The population in the world is increasing at a phenomenal rate, the care for elders has become a big issue for the government and society. In a latest survey it is found that the elders who wanted to sprout in their own house has increased to the rate more than 85%. The main issue is on how to reach elder's need and mitigate burden for their children. The services of nurses could reach 3.3 trillion yuan in the year 2020, so the need for the elderly nursing will increase to a great extend for national economy. Hence the need for robotization for elderly nursing will become trend in future. Research shows that the robots can be designed in various ways with a path towards the wellbeing as main function. Therefore, it is admissible for nursing researchers to develop nursing care robots for the betterment of society and enter a postmodern era and science and practise.***

Key-phrase: ***Requirements for design, self -sufficient nursing robot, multi-tasking, beds for patients, rehabilitation.***

I. INTRODUCTION

Aging population has drawn great public attention with the improvement of living and medical standards. However, many elders are unable to take care of themselves. In a survey it is found that 40% of elders who are above 80 can take care of themselves. But most of the family do not look after the elders, so the need of elderly nursing is a big issue now. The nursing robots has come into picture through the development in science and technology. The nursing robots has different functions to help the elders and take care of them by restoring the self -care abilities in elders and reducing the pressure on family members. The nursing robots can help the disabled patients to move them to different places on wheelchair. These robots can easily interact to humans due to their computer human interaction ability. The humans can control the robots through different modes like voice, facial expressions or an image. The robots also have the ability to remind patients to take medication on time. The robots stores the data of patients and record their activities and provide a report to doctor. Many medical robots also exhibit same properties as nursing robots. Recovery robots can be classified by recovery locations, for example: recovery of waist functions, hand, upper limb, lower limb, ankle recovery. But these equipment's cannot be used for every patient's rather for a specific group of patients, but these robots have a limited mechanical structure so nursing robots are used as they have adaptable features useful for any population. The nursing robots are made of soft material, so they have pretty appearance. They provide psychological comfort to patients along-with nursing the patient's injuries. In recent years, the nursing robots have had a rapid growth.

The four reasons for the rapid development of nursing robots are as follows:

A. Hassle of Aging Society.
B. Health Damage of the Elderly.
C. Insufficient Social Nursing Service.
D. National Laws and Regulations Support.

II. DESIGN REQUIREMENTS OF NURSING ROBOT:

A. Design Requirements for the Nursing Robot

The American Nursing Institute in 1980's put forward a general definition of nursing that is the treatment for human health problems. According to this definition, the robots should find a way for the diagnosis and treatment of patients. So, the main function of the robotic nurse is to find an accurate treatment for different diseases and patient's.

These robots mainly help those patients who are aged or those who are on bed for a long period of time and require assistance. The primary design principle for these robots is to ensure the safety of patient's. The robots should be designed according to the structure and control to ensure safety and its stability. The design of the nursing robot should be in accordance with the structure, control and debugging to ensure its safety and stability.

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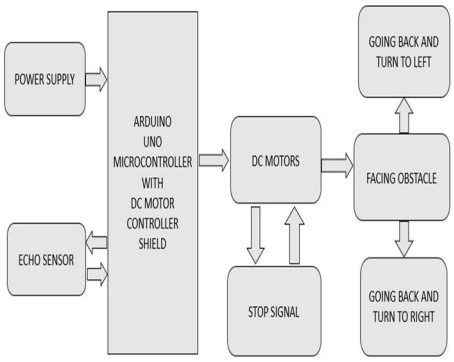
The following are the basic requirements to design a robot-

1) *Civilization:* The robots are designed for the service of humans, so in order to meet the need they should be designed with certain principles. As a result, the design of nursing robots should consider human factors to develop man-machine relationships, behavior of humans, their psychological needs and follow human nature to serve them better.
2) *Surveillance:* To make the nursing robot fit for the task, the intellectual power of a nursing robot should be improved. In consequence to this the nursing robots should be designed in a way so that they can record the human lifestyle on daily basis. The human machine interaction should be established properly.
3) *Calibration and Extensible:* The nursing robots should be designed with calibration and extensible features. Due to this the design cost is reduced, stability is increased and the development cycle is shortened. So the designs principles for these robots will become acquit for the maintenance of nursing robot.

III. COMPONENTS USED:

A. Arduino UNO.
B. Raspberry pi.
C. Node MCU
D. Arduino Nano.
E. IR Sensor.
F. DTH11
G. DS18B20 Sensor.
H. Max30100 Sensor.
I. Ultrasonic Sensor.
J. L298N Dual H Bridge Motor Driver.

IV. BLOCK DIAGRAM FOR ROBOTIC NURSE:



V. INFERENCE

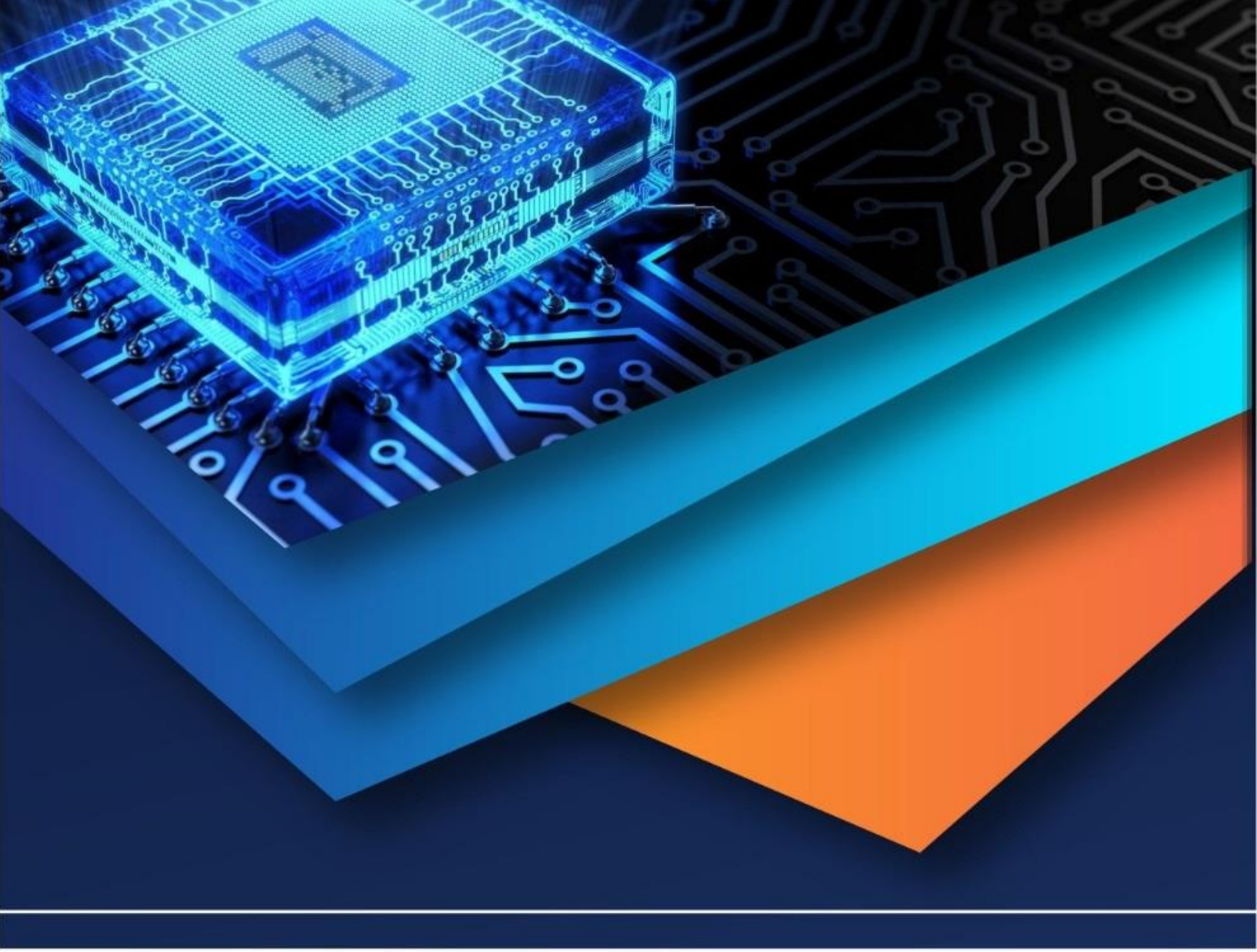
The development of medical welfare robot is can be promoted since it is used in providing health care facilities and is beneficial to people with disabilities and incurable disease. It is also important issue in nursing practice to recognize and live with advanced sciences. Compared to humans, robots are quicker to train, cheaper to maintain, easier to refuel and repair and less prone to be bored by repetitive tasks. They could help the elderly and chronically ill to remain independent, reducing the need for careers and demand. This inference from this paper is challenges in terms of safety and intellect by properly analyzing the nursing robots. But there is need for improvement in the functioning of these robots, so that these robots become useful for more and more patients. This research paper gives meaningful reference for development in the field of nursing career. In future study, we will center on discussing the control strategies of nursing robotics.

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