



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

# IJRSET

International Journal of Innovative Research in  
**SCIENCE | ENGINEERING | TECHNOLOGY**

# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 12, Issue 7, July 2023

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

Impact Factor: 8.423

9940 572 462

6381 907 438

[ijirset@gmail.com](mailto:ijirset@gmail.com)

[www.ijirset.com](http://www.ijirset.com)

# Medical Assistance Robotic Vehicle

Varun S J, Ranganath C, Sharath Kumar KS, Manjunath T, Ms.Niveditha VK

UG Student, Dept. of ECE, PES College of Engineering, Mandya, India

UG Student, Dept. of ECE, PES College of Engineering, Mandya, India

UG Student, Dept. of ECE, PES College of Engineering, Mandya, India

UG Student, Dept. of ECE, PES College of Engineering, Mandya, India

Asst Professor, Dept. of ECE, PES College of Engineering, Mandya, India

**ABSTRACT:** The global COVID-19 pandemic due to the novel coronavirus SARS-CoV-2 has challenged the availability of traditional surface disinfectants. During pandemics like corona or generally in hospitals, the front-line workers such as doctors, nurses, and compounders in hospitals are nearest to the patients. They all need to look after the patients without caring about themselves and hence doctors, nurses, and workers have a high chance of getting contact with the disease. And few of the medical personnel fearing for the disease and their health, they are not ready to work in the hospital. Hence to tackle this problem we have come up with a solution We can categorize medical robots into two main categories. The first category consists of robots helping medical producers fully autonomously, semi-autonomously, or being teleported by medical personnel. The second is, making social robots that will not have direct physical contact with patients or partake in medical interventions but are focused on helping people and supporting them mentally. Our robots fall in the first category. It was known that any distraction from medical procedures and any entertainment that could take a patient's attention off their health problems was beneficial. Many Psychological research projects can confirm this thesis. Also, some experiments made with robots show that interacting with robots reduces pain and stress. Limited amounts of qualified personnel or busy relatives make it impossible to ensure that every man in need has their own assistant.

**KEYWORDS:** Assistant Medical robot, Autonomous robot, Blynk robot, Communication robot, Health monitor robot, Internet robot, IOT robot, Line follower, UV sterilizing robot, Wi-Fi controlled robot.

## I. INTRODUCTION

The 2019 novel coronavirus (nCoV) infection aroused in Wuhan, China, and has extensively spread all over the world since January 2020. WHO declared the outbreak of nCoV as a "Public Health Emergency of International Concern" on 30 January 2020. The World Health Organization (WHO) named this disease as coronavirus disease (COVID-19) in February 2020. To date (1 April 2020), there are 859,965 confirmed cases all around the world with 42,344 deaths and 178,364 recovered. COVID-19 severely affected the USA (188,592 cases), Italy (105,972 cases), Spain (95,923 cases), China (81,554 cases), Germany (71,808 cases), France (52,128 cases), and Iran (44,605 cases). The second largest population country in the world, i.e., India, is also affected by COVID-19, and 1718 confirmed cases with fifty-two deaths on 1 April 2020. There is a vital need to detect the disease at an early stage and instantly quarantine the infected people due to the unavailability of specific drugs for COVID-19. The Chinese Government reported that the diagnosis of COVID-19 is confirmed through RT-PCR. However, RT-PCR suffers from high false-negative rates and is time-consuming. The low sensitivity of RT-PCR is not acceptable in the current epidemic situation. In some cases, the infected people may not be recognized and get suitable treatment on time.

## II. LITERATURE REVIEW

Marcin Zukowski [1] In this paper a concept of the humanoid mobile robot which is dedicated to children hospitals was presented. It was designed for two practical functions; it was a robotic assistant for medical staff and a companion for young patients. Mark Anderson [2], In this an office was made where you can disinfect your keys, phone, and other portables at the reception area's ultraviolet-sterilization stand. In cooler months, the air we breathe was cleansed of mold and bacteria in UV-sterilized heating units as well as blasted by UV fixtures in the office air ducts to eliminate

viruses. Wan-Ling Chang [3], It shows that instead of a robot which completely replaces human labor, nursing home staff prefer robot assistants who fit into their working process. It learned that most appropriate functions for robots in nursing homes were helping with minor works. Shamsudeen Abubakar [4], In this paper it presents a mobile manipulator designed to serve as an assistant to nurses in patient walking and patient sitting tasks in hospital environments. Jesus Alvarez[5] , Nurse-bot it is like-a nurse made robot that monitors vital signs and keeps the information, so that the attending physician has up-to-date parameters before the consultation that allows a better follow-up of the results of the prescribed treatment made by a specialist. Ronald Marchessault [6], the RoNA system in this paper provides physical assistance to nurses in a hospital ward. This robot would increase job satisfaction, reduce lifting-related injuries, and extend the years of effective service nurses could render in hospitals. Danica Mitch M. Pacis1 [8], The trends in the development of the utilization of this technology can be classified into four: patient monitoring, healthcare information technology, intelligent assistance diagnosis, and information analysis collaboration.

### III. METHODOLOGY

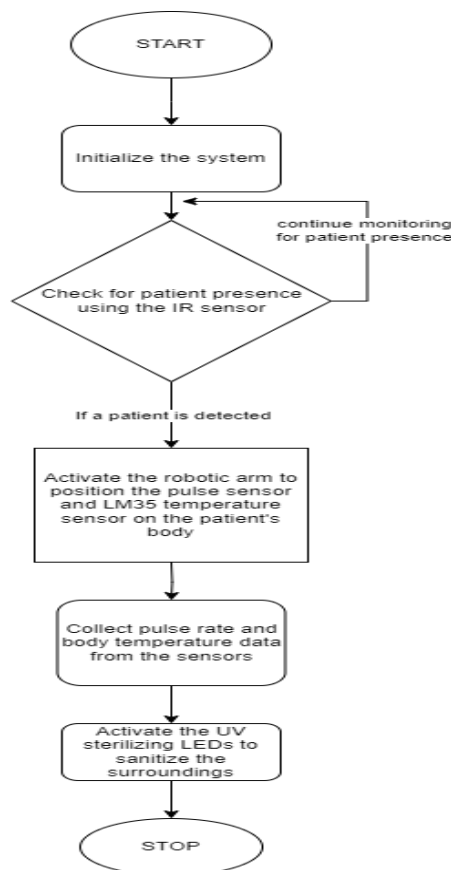


Figure 1: Flow diagram of the sensor inputs and operation of the robot

Figure.1 represents a basic working block diagram of the robot.

### IV. OBJECTIVES

1. Design a cost-effective indoor navigation system based on line follow and obstacle avoidance technology in order to make navigational capabilities more robust.
2. Monitoring basic health parameters like heart rate and temperature using the robot.
3. Medical Transportation: Giving medicines and meals to patients and staff by adding a tray to our robot, thereby optimizing communication between doctors, hospital staff members, and patients.
4. Mobile Application: The dedicated mobile application Blynk includes a virtual joystick for remote control.

## V. COMPONENTS SPECIFICATION

Hardware consisting of Arduino UNO, NodeMCU, Dc motors, Motor driver, 9v battery, LM35 temperature sensor, UV LEDs

Arduino UNO: The Arduino UNO as a microcontroller ATmega328P as shown in Figure 2. Arduino is an open-source platform and its simple design and use ability make it ideal for hobbyists and professionals. The Arduino UNO has 14 digital I/o pins (6 can be used as PWM outputs), 6 analog input pins, a 16 MHz crystal oscillator, a USB connection port, a dc power jack, an ICSP header, and also a reset button



Figure 2: Arduino Microcontroller

NodeMCU: NodeMCU is an open-source development board and firmware based on the widely used ESP8266 - 12E Wi-Fi module as shown in Figure 3. It allows you to program the ESP8266 Wi-Fi module with a powerful LUA programming language or Arduino IDE. Arduino-like hardware I/O, USBTTL included, it has 10 GPIOs D0-D10 with PWM functionality, IIC, SPI communication, 1-Wire, and ADC at A0, etc. is an all-in-one board. It is an Event-driven API for network applications with PCB antenna.



Figure 3: NodeMCU

Motor Driver: L298N Module is a motor driver module for driving DC and Stepper Motors. This module has an L298 motor driver IC and a 78M05 5V regulator. L298N Module can control up to four DC motors, or just two DC motors with directional and speed control as shown in Figure 4

- Driver Chip: Double H Bridge L298N
- Motor Supply Voltage (Maximum): 46V

- Motor Supply Current (Maximum): 2A
- Driver Voltage: 5-35V
- Logical Current: 0-36Ma
- Maximum Power (W): 25W



Figure 4: Motor Driver

MAX30100 Module: The module features the MAX30100 – a modern, integrated pulse oximeter and heart rate sensor IC, from Analog Devices. It combines two LEDs, a photodetector, optimized optics, and low-noise analog signal processing to detect pulse oximetry (SpO<sub>2</sub>) and heart rate (HR) signals as shown in Figure 5.

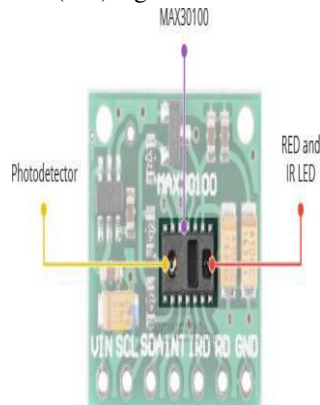


Figure 5: Pulse Oximeter

## VI. CONCLUSIONS AND FUTURE SCOPE

To validate the effectiveness of the proposed model, the literature survey incorporates findings from various studies that have evaluated similar approaches through simulations and real-world scenarios. These evaluations provide insights into the benefits, challenges, and potential limitations of implementing a cloud-based speed control system for semi-autonomous vehicles. Overall, In this project, we have successfully designed and implemented a fully autonomous and cost-effective UV disinfection robot. The robot utilizes 20W UV lamps to sterilize surfaces along a predefined path, ensuring protection against the coronavirus without the need for human intervention. Safety measures such as IR motion sensors have been incorporated to automatically turn off the UV lights when humans or animals are detected, making it safe for operation in various environments. Furthermore, the integration of cognitive abilities through simple

and efficient theoretical approaches can enhance the robot's cleaning efficiency and harmonious integration with humans. Future developments include expanding sensor integration to monitor additional vital signs, incorporating artificial intelligence and machine learning algorithms for proactive interventions and early warnings, integrating telemedicine platforms for remote consultations, implementing autonomous navigation and obstacle detection capabilities, enabling cloud-based data analysis for predictive modeling and population health management, enhancing human-robot interaction through natural language processing, and integrating with electronic health record systems for comprehensive healthcare data management. These advancements aim to further enhance patient care, revolutionize healthcare delivery, and make the robot more environmentally friendly through the utilization of renewable power sources.

## REFERENCES

- [1] P. Chanprakon, T. Sae-Oung, T. Treebupachatsakul, P. Hannanta-Anan, and W. Piyawattanametha, "An ultraviolet sterilization robot for disinfection," in 2019 5th International Conference on Engineering, Applied Sciences and Technology (ICEAST). IEEE, 2019, pp. 1–4.
- [2] N. Yagi, M. Mori, A. Hamamoto, M. Nakano, M. Akutagawa, S. Tachibana, A. Taka-hashii, T. Ikehara, and Y. Kinouchi, "Sterilization using 365 nm uv-led," in 2007 29th Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE, 2007, pp. 5841–5844.
- [3] T. Rubaek, M. Cikotic, and S. Falden, "Evaluation of the uv-disinfection robot," Blue Ocean Robotics, 2016.
- [4] J.-H. Yang, U.-I. Wu, H.-M. Tai, and W.-H. Sheng, "Effectiveness of an ultraviolet-c disinfection system for the reduction of healthcare-associated pathogens," *Journal of Microbiology, Immunology and Infection*, vol. 52, no. 3, pp. 487–493, 2019.
- [5] G. Katara, N. Hemvani, S. Chitnis, V. Chitnis, and D. Chitnis, "Surface disinfection by exposure to germicidal uv light," *Indian journal of medical microbiology*, vol. 26, no. 3, pp. 241–242, 2008.
- [6] R. Thukral, A. Kumar, A. Arora et al., "Effects of different radiations of electromagnetic spectrum on human health," in 2020 IEEE International Students' Conference on Electrical, Electronics and Computer Science (SCEECS). IEEE, 2020, pp. 1–6.
- [7] M. Islam and M. Rahman, "Design and fabrication of line follower robot," *Asian Journal of Applied Science and Engineering*, vol. 2, no. 2, pp. 27–32, 2013.
- [8] R. Rafi, "Shuva das, nowsher ahmed, iftekhar hossain, sm taslim reza," "design and implementation of line following robot", ieee," in 19th International Conference on Computer and Information Technology, 2016.
- [9] H. U. Zaman, M. M. H. Bhuiyan, M. Ahmed, and S. T. Aziz, "A novel design of line following robot with multifarious function ability," in 2016 International conference on microelectronics, computing and communications (MicroCom). IEEE, 2016, pp. 1–5.
- [10] Y. Pawar, A. Chopde, and M. Nandre, "Motion detection using pir sensor," *International Research Journal of Engineering and Technology*, vol. 5, no. 04, 2018.
- [11] K. Deo, R. Deedwania, and S. Bairagi, "Human intrusion and motion detection system," *International Journal of Computer Applications*, vol. 975, p. 8887.
- [12] A. Begic, "Application of service robots for disinfection in medical institutions," in *Advanced Technologies, Systems, and Applications II: Proceedings of the International Symposium on Innovative and Interdisciplinary Applications of Advanced Technologies (IAT)*. Springer, 2018, pp. 1056–1065.
- [13] A. Al-Shamma'a, I. Pandithas, and J. Lucas, "Lowpressure microwave plasma UV lamp for water purification and ozone production," in *PPPS-2001 Pulsed Power Plasma Science 2001. 28th IEEE International Conference on Plasma Science and 13th IEEE International Pulsed Power Conference. Digest of Papers (Cat. No. 01CH37251)*, vol. 2. IEEE, 2001, pp. 1082–1085.
- [14] K. M. Hasan, A. Al Mamun et al., "Implementation of autonomous line follower robot," in 2012 International Conference on Informatics, Electronics and Vision (ICIEV). IEEE, 2012, pp. 865–869.
- [15] A. Moulay, F. Laoufi, T. Benslimane, and O. Abdelkhalek, "Fpga-based car-like robot path follower with obstacle avoidance," in 2020 2nd International Conference on Mathematics and Information Technology (ICMIT). IEEE, 2020, pp. 125–131.
- [16] E. C. Friedberg, G. C. Walker, W. Siede, and R. D. Wood, *DNA repair and mutagenesis*. American Society for Microbiology Press, 2005.



[17] A. Chaturvedi, P. Kumar, and S. Rawat, "Proposed novel security system based on passive infrared sensor," in 2016 International Conference on Information Technology (InCITE)-The Next Generation IT Summit on the Theme- Internet of Things: Connect your Worlds. IEEE, 2016, pp. 44–47. Dept. of ECE, PESCE, Mandya 2022-23 30



**INNO SPACE**  
SJIF Scientific Journal Impact Factor  
**Impact Factor: 8.423**



**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

**9940 572 462** **6381 907 438** **ijirset@gmail.com**



[www.ijirset.com](http://www.ijirset.com)

Scan to save the contact details