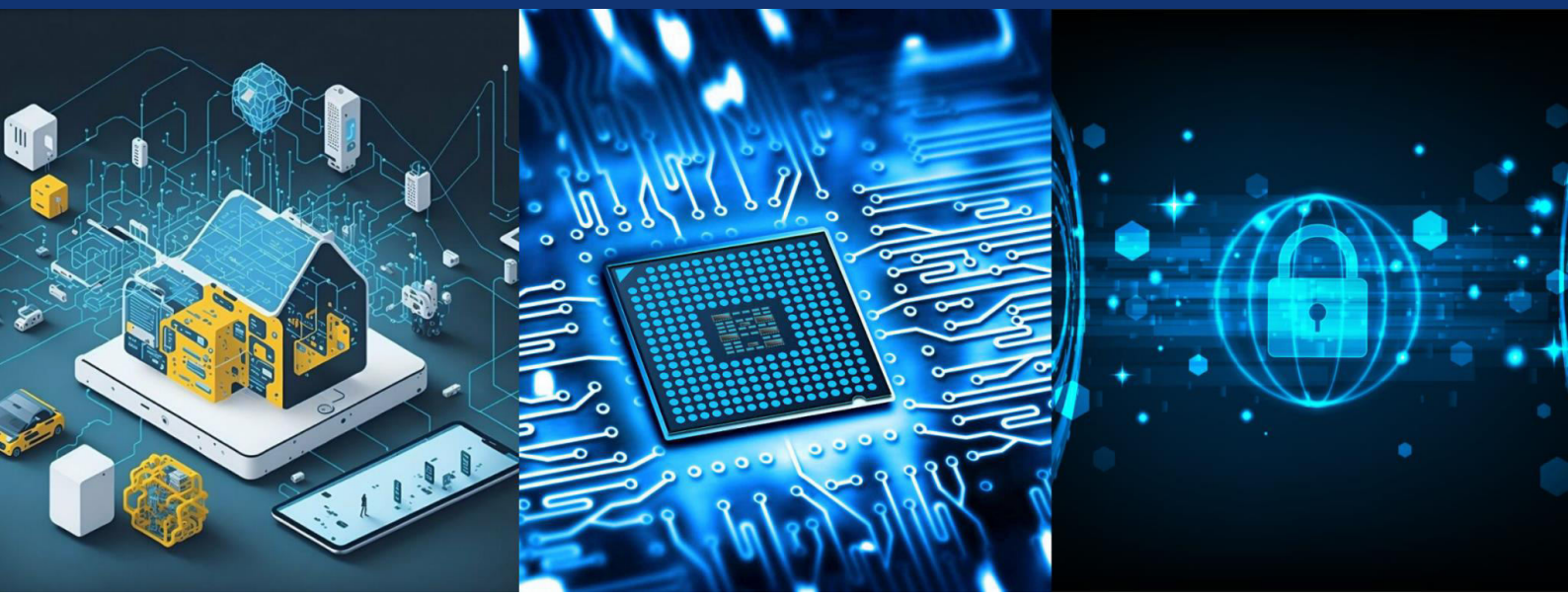
IJIRCCE

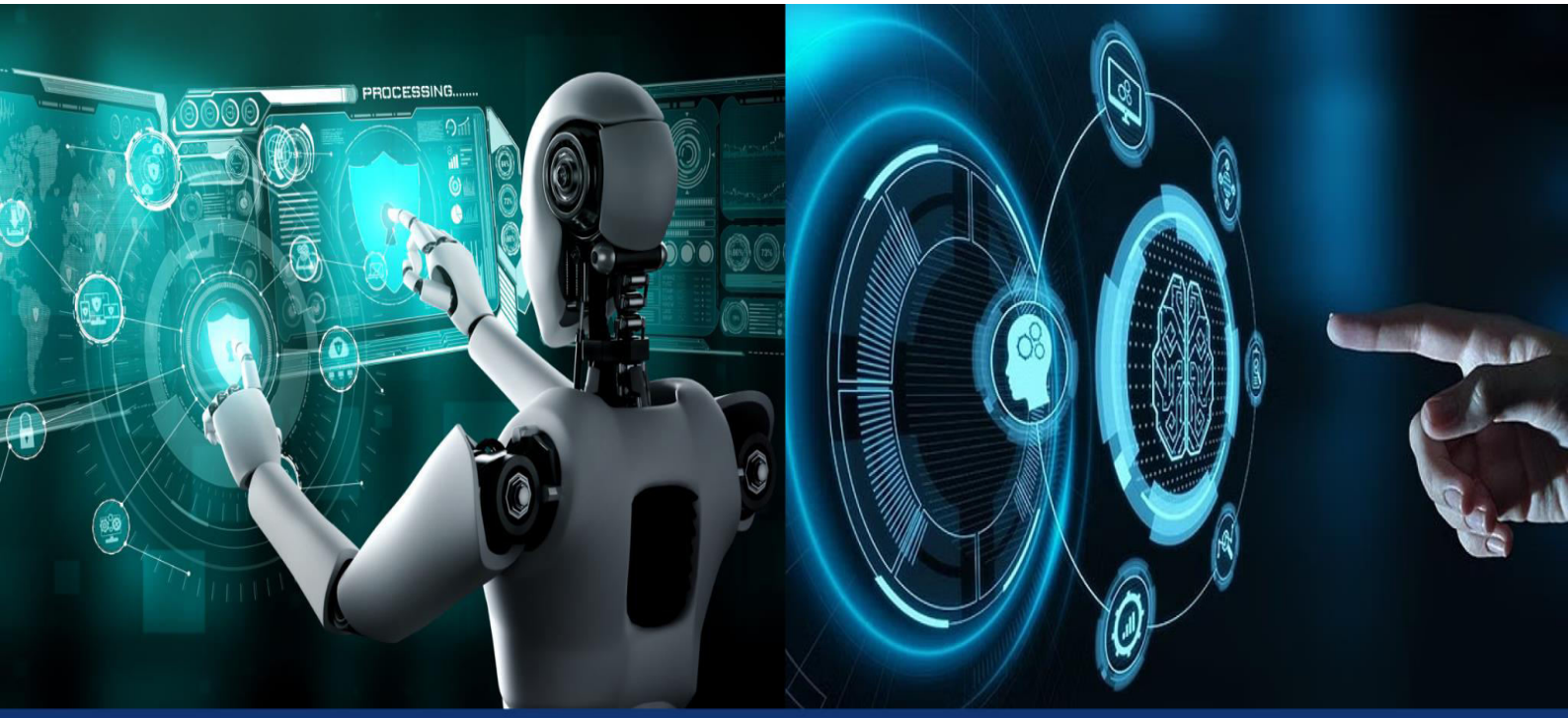
ISSN(O): 2320-9801

ISSN(P): 2320-9798



International Journal of Innovative Research in Computer and Communication Engineering

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)



Impact Factor: 8.771

Volume 13, Issue 5, May 2025

© 2025 IJIRCCE | Volume 13, Issue 5, May 2025| DOI:10.15680/IJIRCCE.2025.1305023

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 8.771| ESTD Year: 2013|

International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

MEDIVOX: Doctor Checkup & Prescription Management

R. Abdul Sikkandhar[1], Harshini B[2], Mary Jensia P[3], Mahalakshmi N[4]

Assistant Professor, Department of ECE, Sethu Institute of Technology, Virudhunagar Dt., Tamil Nadu, India[1]

UG Students, Department of ECE, Sethu Institute of Technology, Virudhunagar Dt., Tamil Nadu, India[2-4]

ABSTRACT: The incorporation of IoT into healthcare has transformed patient care and medication management through instantaneous data gathering and examination. This initiative introduces an IoT-driven system that persistently tracks patients' vital indicators, particularly oxygen saturation (SpO_2) and body heat, to enable automated prescription delivery via cloud-based interaction. The setup utilizes medical sensors to record health metrics, which are then processed by an embedded controller and sent to a cloud platform for immediate access by physicians. Depending on the recorded values, the system can suggest suitable medications or notify healthcare experts for manual assessment. This method ensures prompt and precise prescriptions, minimizing treatment delays and improving remote patient care. The proposed framework enhances accessibility, reduces hospital visits, and boosts overall healthcare efficiency by harnessing IoT for smart health monitoring and prescription automation.

KEYWORDS: IoT, real-time health monitoring, smart health system, Arduino microcontroller, SpO_2 sensor, cloud-based healthcare, remote patient monitoring.

I. INTRODUCTION

The demand for internet application development is substantial. IoT serves as a key technology for creating various beneficial internet applications. In essence, IoT is a network where all physical objects connect to the internet via network devices or routers and share data. It allows for remote control of objects through existing network infrastructure. IoT is an intelligent and effective technique that minimizes human effort while providing easy access to physical devices. This technology also features autonomous control, enabling device operation without human interaction.

II. RELATED WORK

IoT and cloud computing have transformed healthcare by enabling real-time patient monitoring. Current systems employ biomedical sensors to monitor SpO_2, temperature, heart rate, and blood pressure, transmitting data to cloud platforms for physician access. While numerous healthcare frameworks concentrate on remote monitoring and data analysis, they often lack automated prescription management. Some integrate machine learning for risk prediction, but manual intervention remains crucial. MEDIVOX enhances existing solutions by combining real-time monitoring with automated prescription suggestions, decreasing hospital visits and improving healthcare efficiency.

III. METHODOLOGY

The MEDIVOX system integrates IoT, cloud computing, and automation technologies to enhance real-time patient monitoring and medication administration. This platform utilizes biomedical sensors to continuously monitor vital signs like SpO_2 and body temperature. A built-in microcontroller processes these readings to ensure accuracy before transmitting them to a cloud platform via Wi-Fi or IoT communication protocols. The cloud infrastructure enables physicians to access patient health data remotely in real-time. After the information is stored in the cloud, an automated analysis assesses the patient's health condition. If the measured values exceed predefined medical thresholds, the system either generates automated prescription recommendations or notifies healthcare professionals for manual intervention.

© 2025 IJIRCCE | Volume 13, Issue 5, May 2025| DOI:10.15680/IJIRCCE.2025.1305023

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 8.771| ESTD Year: 2013|

International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

IV. SYSTEM MODULES

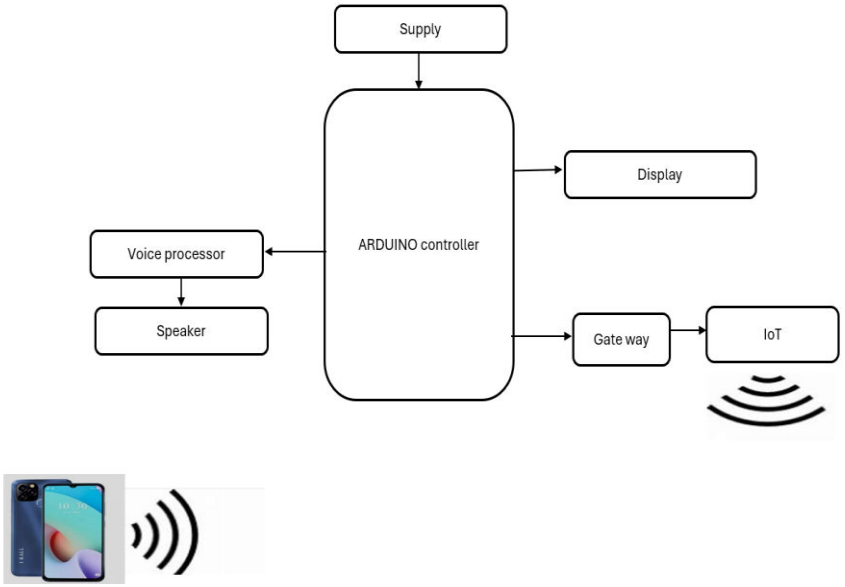
Sensor Module: This unit comprises temperature and SpO_2 sensors that perpetually measure body temperature, pulse rate, and oxygen saturation. These sensors are directly linked to an Arduino microcontroller, ensuring precise real-time health monitoring.

Processing Module: The Arduino microcontroller manages the raw sensor data, implements noise reduction techniques, and confirms accuracy before sending it for further analysis or storage.

Communication Module: This component facilitates wireless data transmission through Wi-Fi or Bluetooth, allowing real-time access to health information via a cloud platform or mobile application. This feature guarantees uninterrupted monitoring by users and healthcare providers.

Alert Module: When abnormal health readings are detected, this unit sends immediate alerts through mobile notifications, SMS, or emails. This functionality allows for prompt medical intervention, minimizing health risks.

User Interface Module: A mobile or web-based dashboard allows users to track their vital signs, examine historical data trends, and obtain health recommendations. This interactive platform offers easy access to personal health information and promotes proactive healthcare management.



V. EXPERIMENTAL RESULTS

The MEDIVOX system was evaluated to assess its effectiveness in real-time patient monitoring and automated prescription management. Biomedical sensors accurately measured SpO_2 and body temperature, with data successfully processed by the embedded microcontroller and sent to the cloud platform. Doctors could access up-to-date patient information through the web/mobile application, ensuring remote monitoring capabilities. The system efficiently analyzed health parameters, providing automated prescription suggestions when values deviated from normal ranges. In critical situations, timely alerts were sent to healthcare professionals for intervention. The results showed improved accuracy, reduced response time, and enhanced accessibility, confirming the system's role efficient remote healthcare management.

© 2025 IJIRCCE | Volume 13, Issue 5, May 2025| DOI:10.15680/IJIRCCE.2025.1305023

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 8.771| ESTD Year: 2013|

International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

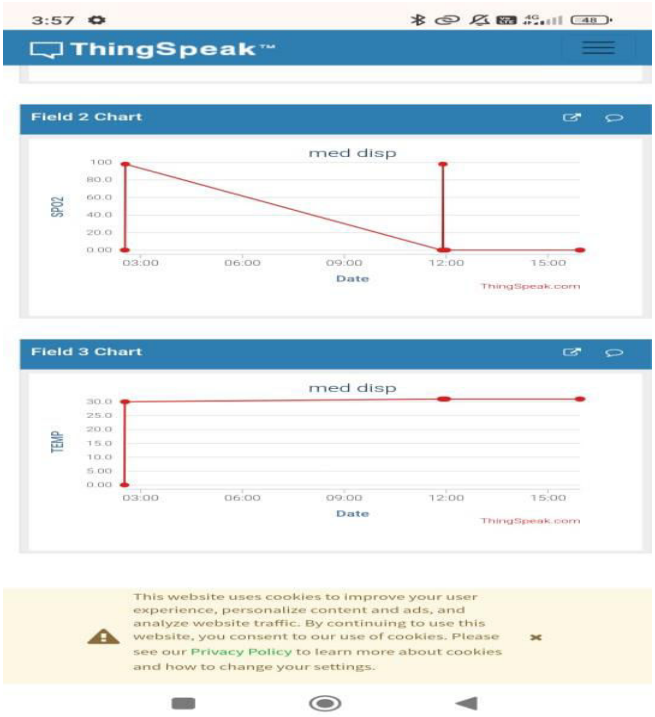


Figure 1: The real time patient health such as Temperature, Pulse, Heart rate.

In Figure 1, the proposed IoT-based health monitoring system was successfully implemented and tested for real-time tracking of vital parameters, including body temperature. pulse rate, and oxygen saturation (SpO2). Experimental results demonstrated the system's accuracy and reliability, with sensor readings closely matching standard medical devices.

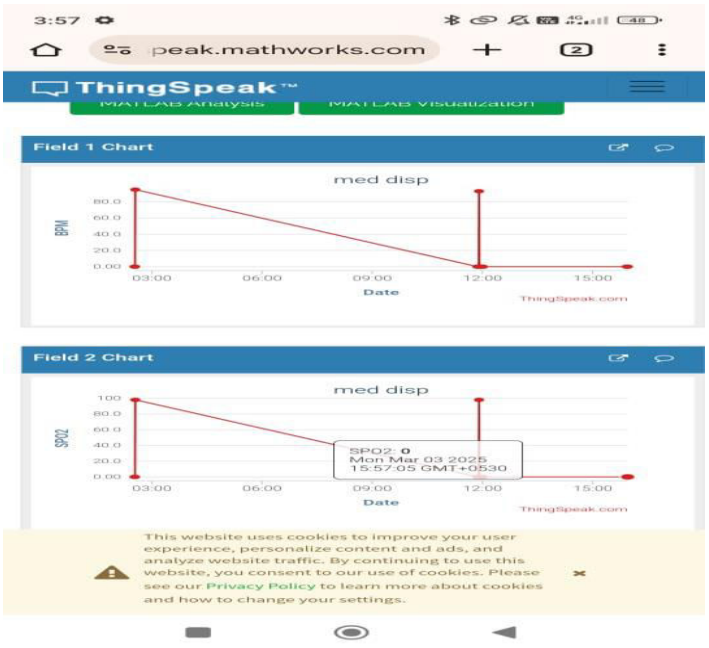


Figure 2: Output of Vital Health Based on Time Through Graph.

© 2025 IJIRCCE | Volume 13, Issue 5, May 2025| DOI:10.15680/IJIRCCE.2025.1305023

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 8.771| ESTD Year: 2013|

International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

In Figure 2, it shows the Experimental results demonstrated the system's accuracy and reliability, with sensor readings closely matching standard medical devices. The system's performance was evaluated based on response time, accuracy, and power efficiency, showing minimal latency and high precision in data acquisition and processing.

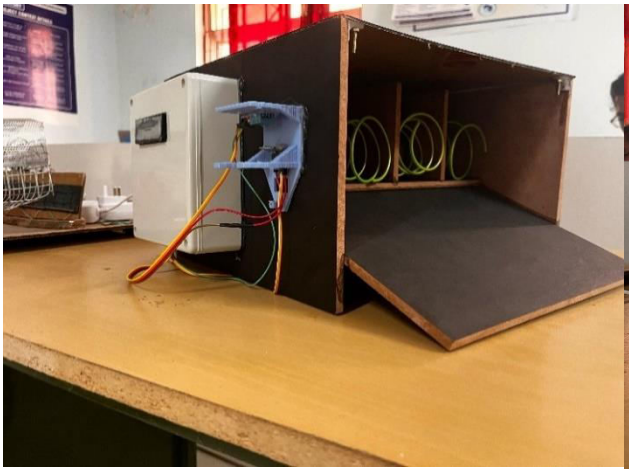


Figure 3 **Figure 4**

Figures 3 & 4: Product of MEDIVOX System

In Figures 3 & 4 **the** product of MediVox System enhances security, especially in public spaces at night, by combining lot and robotics for real-time surveillance and quick emergency responses. It can be applied in industrial zones, commercial buildings, residential areas, military facilities, and public infrastructure. Wireless connectivity enables remote monitoring, providing actionable insights from any location. This system reduces human fatigue, improves accuracy, and boosts security efficiency.

Figure 5: BT Terminal

The real-time data transmission via Wi-Fi ensured seamless remote monitoring, and the alert system effectively notified users of abnormal readings, enabling timely medical intervention. The system's performance was evaluated based on response time, accuracy, and power efficiency, showing minimal latency and high precision in data acquisition and processing. The user interface provided clear visualization of health metrics, making it accessible for both patients and healthcare providers. The results highlight the system's potential for remote healthcare, reducing hospital visits while improving continuous health tracking.

www.ijircce.com | e-ISSN: 2320-9801, p-ISSN: 2320-9798| Impact Factor: 8.771| ESTD Year: 2013|

International Journal of Innovative Research in Computer and Communication Engineering (IJIRCCE)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

VI. CONCLUSION

The proposed IoT-based health monitoring system effectively tracks vital parameters such as body temperature, pulse rate, and SpO_2 in real-time with high accuracy and minimal latency. The platform ensures seamless remote monitoring via Wi-Fi and delivers immediate alerts for abnormal readings, enabling timely medical intervention. Its cost-effective and compact design makes it suitable for remote patient care and emergency healthcare scenarios. While challenges such as network dependency and sensor calibration exist, future enhancements may include AI-driven diagnostics, improved data security, and expanded sensor capabilities to optimize healthcare accessibility and efficiency, potentially reducing hospital visits while enhancing continuous health tracking.

REFERENCES

[1] F. Zaccaria, A. Baldassarri, G. Palli and M. Carricato, "A Mobile Robotized System for Depalletizing Applications: Design and Experimentation," in *IEEE Access*, vol. 9, pp. 96682-96691, 2021, doi: 10.1109/ACCESS.2021.3092580.

[2] Malasinghe, L.P., Ramzan, N. & Dahal, K. Remote patient monitoring: a comprehensive study. *J Ambient Intell Human Comput* **10**, 57–76 (2019). https://doi.org/10.1007/s12652-017-0598-x

[3] Y. Shen *et al*., "Robots Under COVID-19 Pandemic: A Comprehensive Survey," in *IEEE Access*, vol. 9, pp. 1590-1615, 2021, doi: 10.1109/ACCESS.2020.3045792.

[4] W. Hong, Z. Xiong, N. Zheng and Y. Weng, "A Medical-History-Based Potential Disease Prediction Algorithm," in *IEEE Access*, vol. 7, pp. 131094-131101, 2019, doi: 10.1109/ACCESS.2019.2940644.

[5] J. Wang *et al*., "Task Autonomous Medical Robot for Both Incision Stapling and Staples Removal," in *IEEE Robotics and*

[6] J. Li *et al*., "A Human-Robot Skill Transfer Framework of Mobile Medical Robots for Autonomous Motion with Teaching by Demonstration," *2020 5th International Conference on Advanced Robotics and Mechatronics (ICARM)*, Shenzhen, China, 2020, pp. 209-213, doi: 10.1109/ICARM49381.2020.9195398.

[7] Y. Xia, Q. Li, R. Huang and X. Zhao, "Design of Intelligent Medical Service Robot based on Raspberry Pi and STM32," *2022 IEEE 10th Joint International Information Technology and Artificial Intelligence Conference (ITAIC)*, Chongqing, China, 2022, pp. 1577-1581, doi: 10.1109/ITAIC54216.2022.9836515.

[8] H. Cao, R. Chen, Y. Gu and H. Xu, "Cloud-assisted tracking medical mobile robot for indoor elderly," *2017 IEEE 3rd Information Technology and Mechatronics Engineering Conference (ITOEC)*, Chongqing, China, 2017, pp. 927-930, doi: 10.1109/ITOEC.2017.8122489.

[9] J. Chen, X. Zhan, Y. Wang and X. Huang, "Medical Robots based on Artificial Intelligence in the Medical Education," *2021 2nd International Conference on Artificial Intelligence and Education (ICAIE)*, Dali, China, 2021, pp. 1-4, doi: 10.1109/ICAIE53562.2021.00008.

[10] Islam MM, Rahaman A, Islam MR. Development of Smart Healthcare Monitoring System in IoT Environment. SN Comput Sci. 2020;1(3):185.

[11] G. Peleka *et al*., "RAMCIP - A Service Robot for MCI Patients at Home," *2018 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Madrid, Spain, 2018, pp. 1-9,

[12] M. Limin and Z. Peiyi, "The medical service robot interaction based on kinect," *2017 IEEE International Conference on Intelligent Techniques in Control, Optimization and Signal Processing (INCOS)*, Srivilliputtur, India, 2017, pp. 1-7,

[13] K. A. R. Carranza *et al*., "Akibot: A Telepresence Robot for Medical Teleconsultation," *2018 IEEE 10th International Conference on Humanoid, Nanotechnology, Information Technology,Communication and Control, Environment and Management (HNICEM)*, Baguio City, 2021, pp. 1-4

[14] H. A. Hadi, "Line Follower Robot Arduino (using robot to control Patient bed who was infected with Covid-19 Virus)," *2020 4th International Symposium on Multidisciplinary Studies and Innovative Technologies (ISMSIT)*, Istanbul, Turkey, 2020, pp. 1-3,

[15] Chen, X. Zhan, Y. Wang and X. Huang, "Medical Robots based on Artificial Intelligence in the Medical Education," *2021 2nd International Conference on Artificial Intelligence and Education (ICAIE)*, Dali, China, 2021, pp. 1-4, doi: 10.1109/ICAIE53562.2021.00008.

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

INNO SPACE SJIF Scientific Journal Impact Factor

doi crossref

निस्केयर NISCAIR

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

9940 572 462 6381 907 438 ijircce@gmail.com

www.ijircce.com

Scan to save the contact details