



# Design and Implementation of an Intelligent Reception and Guidance Robot using IOT

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## ABSTRACT

In recent years, intelligent robotic systems have become an important part of smart automation in public and institutional environments. This paper presents the design and implementation of an intelligent reception and guidance robot using Internet of Things IoT technology. The developed robot is intended to support visitors in places such as educational institutions, hospitals, offices, airports, and shopping complexes by offering automated reception and navigation assistance. The proposed system integrates an IoT-enabled microcontroller, ultrasonic sensors, motor control circuits, and a cloud communication platform to provide real-time monitoring and autonomous operation. The robot receives user requests, identifies pre-programmed destinations, and guides users safely using obstacle detection and motion control mechanisms. The implemented prototype demonstrates effective indoor navigation, visitor interaction, and obstacle avoidance with low hardware complexity.

## LITERATURE REVIEW

The intelligent reception and guidance robot is designed as an embedded mobile robotic platform with IoT communication capability. The overall system consists of three main units: user interaction unit, navigation and motion control unit, and IoT communication and monitoring unit.

The robot remains at the reception point and interacts with visitors using a display or voice-based greeting. The user selects a destination from the

available options, and the robot starts guiding the user toward the selected location. During movement, the robot continuously senses obstacles and adjusts its motion accordingly.

## HARDWARE

The hardware architecture of the system is built using low-cost and easily available embedded components. The major hardware elements include ESP32/NodeMCU controller, ultrasonic sensor, motor driver module (L298N), DC geared motors, LCD/OLED display, and rechargeable battery pack.

The microcontroller acts as the central processing unit of the robot. The ultrasonic sensor is used for obstacle detection. The motor driver circuit interfaces the controller with the DC motors and Reduced operational cost.

## Keywords—

IoT, Intelligent Robot, Reception System, Guidance Robot, Automation, Obstacle Detection, Smart Navigation.



## INTRODUCTION

The rapid growth of automation and embedded technologies has significantly influenced the development of intelligent robotic systems for service-oriented applications. Reception and visitor guidance are essential services in institutions such as colleges, hospitals, office buildings, railway stations, airports, and commercial centers. In conventional environments, these services are generally managed by human operators, which may result in increased manpower requirements, response delays, and operational inefficiencies.



## BLOCK DIAGRAM:

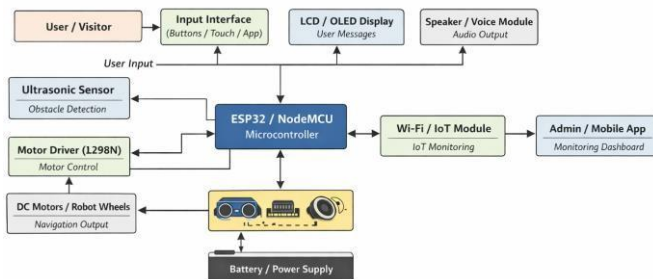


Fig. 1. Block Diagram of Intelligent Reception and Guidance Robot Using IoT.

## SOFTWARE

The robot is programmed using embedded C/C++ in the Arduino IDE environment. The software design focuses on user interaction, motion control, sensor monitoring, and IoT communication.

Algorithm: Initialize controller, sensors, motors, and IoT connection; display welcome message; wait for destination input; retrieve route information; move robot; detect obstacles; update IoT dashboard; reach destination; and return to initial position.

## CONCLUSION AND FUTURE WORK

This paper presented the design and implementation of an intelligent reception and guidance robot using IoT technology. The developed system combines embedded control, wireless communication, obstacle detection, and mobile navigation to provide automated reception and indoor guidance services. The implementation results demonstrate that the proposed system is effective, economical, and practical for use in smart institutions and public service environments.



## REFERENCES

- [1] S. Thrun, W. Burgard, and D. Fox, Probabilistic Robotics. Cambridge, MA, USA: MIT Press, 2005.
- [2] K. Ashton, “That ‘Internet of Things’ Thing,” RFID Journal, vol. 22, no. 7, pp. 97–114, 2009smart environments: A review,” International Journal of Advanced Robotic Systems, vol. 16, no. 4, pp. 1–12, 2019.
- [3] P. P. Ray, “A survey on Internet of Things architectures,” Journal of King Saud University – Computer and Information Sciences, vol. 30, no. 3, pp. 291–319, 2018.
- [4] H. Choset et al., Principles of Robot Motion: Theory, Algorithms, and Implementations. Cambridge, MA, USA: MIT Press, 2005.
- [5] A. Al-Fuqaha et al., “Internet of Things: A survey on enabling technologies, protocols, and applications,” IEEE Communications Surveys & Tutorials, vol. 17, no. 4, pp. 2347–2376, 2015.
- [6] R. Siegwart, I. R. Nourbakhsh, and D. Scaramuzza, Introduction to Autonomous Mobile Robots, 2nd ed. Cambridge, MA, USA: MIT Press, 2011.
- [7] M. B. Yassein, W. Mardini, and A. Khalil, “Smart homes automation using IoT-based sensing and monitoring platform,” International Journal of Computer Applications, vol. 182, no. 30, pp. 7–12, 2019.