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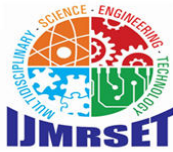
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Human Following Robot using IOT

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ABSTRACT: This paper presents a novel approach to streamline and optimize hotel waiter services through the implementation of a payload-based system utilizing Bluetooth technology. Traditional waiter services in hotels often face challenges such as inefficiencies in order delivery, communication gaps, and resource allocation. Toward speech these matters, our projected system leverages Bluetooth modules integrated into the hotel's infrastructure and waiter devices. The system operates by assigning each waiter a Bluetooth-enabled device equipped with a payload tracking mechanism. When a guest places an order, the order details are wirelessly transmitted to the nearest available waiter device through Bluetooth communication. The waiter's device then receives the payload information, including the order details, table number, and customer preferences.

KEYWORDS: Arduino, DC gear motor, Infrared sensor, Microcontroller, Ultrasonic sensor, Robot.

I. INTRODUCTION

In the dynamic landscape of hospitality, technological advancements continue to revolutionize guest experiences and streamline operational efficiency. One such innovation poised to redefine service delivery in hotels is the payload-based hotel waiter system leveraging Bluetooth technology.

Traditionally, hotel guests rely on manual requests or interactions with staff to fulfil their needs, whether it's ordering room service, requesting amenities, or seeking assistance. However, the integration of Bluetooth modules into hotel service infrastructure presents an opportunity to enhance convenience, responsiveness, and personalization for guests while optimizing resource allocation and operational workflows for hotel management.

The essence of the planned system lies in empowering guests with handheld devices or smartphone applications equipped with Bluetooth connectivity. Through these interfaces, guests can seamlessly communicate their requests, preferences, and feedback to the hotel staff, initiating a streamlined process of service delivery.

The key component of this system is the payload-based approach, which entails associating each guest request with a unique digital payload transmitted via Bluetooth. This payload contains essential information such as the guest's room number, specific request details, and priority level. Upon receiving the payload, strategically deployed Bluetooth receivers located throughout the hotel's service areas relay the information to designated staff members or departments responsible for fulfilling the request.

Paper is organized as follows. Section II describes automatic text detection using morphological operations, connected component analysis and set of selection or rejection criteria. The flow diagram represents the step of the algorithm. After detection of text, how text region is filled using an Inpainting technique that is given in Section III. Section IV presents experimental results showing results of images tested. Finally, Section V presents conclusion.

II. RELATED WORK

1. K. Somaratne "Investigation of period harmonization grounded arranged present size aimed at Bluetooth Short Liveliness (BLE)," in IEEE IEMCON, pp. 602 – 607, Vancouver, OCT. 2017. The literature study arranged the Payload-Based Hotel Waiter System encompasses an in-depth exploration of several critical themes. Firstly, Bluetooth technology emerges as a fundamental enabler for facilitating seamless communication between devices over short distances[1].



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2. F. J. Dian then A. Yousefi, "LTE IoT Technology Enhancements and Case Studies," in IEEE Consumer Electronics Magazine. Its versatility, as demonstrated across various industries, advises the situation possible fitness aimed at implementing the Payload-Based Hotel Waiter System, which relies heavily on efficient device connectivity and data transmission. However, challenges such as privacy concerns, technical intricacies, and integration complexities necessitate careful consideration[2].
3. Las Vegas "Low-power Coordinated Multi-channel Facts Gaining Communiqué Scheme," in IEEE CCWC, pp. 1027-1031, Jan. 2019. Moreover, contemporary hospitality technology trends underline the increasing adoption of digital solutions to enhance guest experiences and streamline operational processes. This trend underscores the relevance of knowledges such by way of mobile applications then Net of Garments devices in aligning with the evolving preferences and expectations of modern travellers. Overall, while direct literature on the Payload-Based Hotel Waiter System may be limited[3].
4. F. J. Dian, "The analytical system aimed at control ingesting of battery-operated outlying BLE bulges," in 9th IEEE CCWC, pp. 1021-1026, Jan. 2019. Additionally, the correlation between efficient service delivery and guest satisfaction, central to the hospitality industry, is emphasized trendy the works. Innovative systems like the Payload-Based Hotel Waiter System are seen as pivotal in enhancing service responsiveness and customizing guest interactions, ultimately fostering Insights gleaned from research on similar systems offer valuable recommendations for effective implementation strategies, highlighting the importance of meticulous planning and consideration of potential pitfalls[4].
5. S. Lim, "Period preparation of dominant BLE aimed at joining actions," in IEEE IEMCON, pp. 763- 767, Vancouver, Nov. 2018. Heightened levels of guest satisfaction and loyalty. Furthermore, research underscores the potential for operational optimization within hotel establishments through the strategic deployment of technology-driven solutions. By automating guest requests, streamlining task allocation, and providing real-time data analytics, the Payload-Based Hotel Waiter System holds promise in enhancing operational efficiency and optimizing resource allocation[5].

III. METHODOLOGY

The existing system for hotel service typically involves guests making requests either in person or through traditional means such as phone calls or filling out forms. Hotel staff then manually process these requests, which can sometimes lead to delays or errors. However, this system often lacks a structured way to track and prioritize guest requests efficiently. Additionally, there may be challenges in coordinating staff responses to multiple requests simultaneously. Overall, the existing system may not fully optimize the delivery of services to guests.

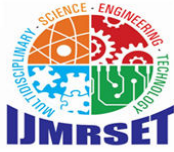
In the current hotel service system, guests make requests through phone calls or in person. Hotel staff handle these requests manually, which can cause delays and errors. However, there's often no organized way to track or prioritize guest requests, leading to potential inefficiencies in service delivery.

Additionally, there is limited ability to track guest requests and preferences systematically, and guests may not receive personalized service tailored to their specific needs.

The future scheme aimed on a Human Following Robot aims to modernize and streamline hotel service delivery using Bluetooth technology. Here's a simplified overview of how it works.

Guests will consume admission towards a moveable app or handheld device equipped with Bluetooth connectivity. Finished this border, they container easily place requests for services, amenities, or assistance directly to the hotel staff. Bluetooth modules will be installed strategically throughout the hotel's service areas, including guest rooms, hallways, and common areas. These modules act as receivers, capturing and transmitting guest requests to designated staff members or departments.

Each guest request is assigned a unique digital payload containing essential information such by way of the guest's



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room number, specific request details, and priority level. This payload is transmitted via Bluetooth to ensure accurate and efficient communication.

Upon receiving the digital payload, hotel staff members are promptly notified of the guest request through their devices or communication system. Staff canteen prioritize and fulfill requests in a timely manner, optimizing resource allocation and enhancing guest satisfaction.

The system collects data on guest requests, response times, and service drifts, if valued visions aimed at hotel management. This information container update working choices, classify parts aimed at development, then enhance overall service quality.

The methodology for implementing Human Following Robot begins with a comprehensive needs assessment, where the current service delivery process is thoroughly analyzed towards classify areas for improvement. Following this, an evaluation of suitable Bluetooth-enabled devices is conducted, considering factors like range, compatibility, and durability. Designing the system architecture involves determining the communication protocol, data format, and integration with existing hotel systems. Once designed, a prototype of the system is developed, encompassing both hardware and software components, followed by pilot testing to assess functionality and usability. Feedback from guests and staff during this phase informs refinements and optimizations to ensure seamless integration. Training sessions for hotel staff precede the gradual implementation of the system across all hotel rooms and service areas. Continuous monitoring and evaluation post-implementation guide further improvements, with scalability and expansion considerations factored in for future growth. Finally, fostering a culture of continuous improvement ensures the system remains aligned with evolving guest needs and industry trends through regular reviews and updates.

IV. EXPERIMENTAL RESULTS

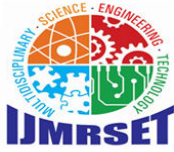
This Bluetooth control car is used to provide or serve the food to the customers with the use of Bluetooth connection. With the directions of left, right, front and back. Ultrasonic sensor is used, because if any objects are detected the car will be automatically stopped during movements.

V. CONCLUSION

Human Following Robot heralds a new era in hospitality service delivery, offering a transformative solution to longstanding challenges faced by hotels. By harnessing Bluetooth technology and streamlined communication protocols, this innovative system promises to elevate guest experiences to unprecedented levels of convenience and personalization. Through faster response times, seamless communication channels, and automated task prioritization, guests can expect heightened satisfaction and loyalty. Simultaneously, hotel management stands to benefit from better working efficiency, price investments, then data-driven insights into guest preferences. This scheme non one happens the immediate needs of today's travellers but also lays the groundwork for future scalability and invention popular the hospitality industry. As hotels strive to differentiate themselves in a competitive market, the Payload Based Hotel Waiter System emerges as a game-changer, redefining the standards of service excellence and setting new benchmarks for guest-centricity in hospitality.

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