



ROBOTIC RECEPTIONIST

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ABSTRACT

Many researchers are investigating on the subject of human-robot social interaction, one area that has remained relatively unexplored is that of continued long-term interaction. Intelligent robots will make a chance for us to make use of it in our daily lives. Most of us, however, do not think they are friendly enough to be used most frequently. Therefore implementation of user friendly robot is very important. This project is based on a robot, ROBO-R which is placed in a company reception as replacement for human receptionist and interacts with the clients.

Keywords— IOT, Raspberry pi, Robo-R, Client, MySQL

I. INTRODUCTION

It is an idea of a robotic receptionist which can fulfil the job of a receptionist in an office/company. With the growing technology and the vast use of artificial intelligence, the ROBO-R does all the work which a receptionist can do. Use of image processing, text to speech conversion. The ROBO-R will be installed with a Raspberry Pi and Pi camera for face detection and recognition. The base of the robot consists of a node MCU which is connected to a H-bridge and power supply. The power supply, supplies power to the H-bridge and node MCU. The H-bridge controls the speed and direction of the robot. While the dc motor rotates the wheel of the robot for movement. An IR sensor is connected with arduino board and a node MCU. The IR sensor detects any movement at entrance if any person enters the office. The sensor intimates the server about the detection. Henceforth, the server sends a signal to ROBO-R. As soon as ROBO-R gets the signal from server, it starts moving towards the entrance to receive the visitor. Due to face recognition, the ROBO-R will check its database if the visitor is new or if there is any previous data of the visitor. Accordingly, the robotic receptionist sends a request to the concerned person and fix an appointment. The requested person asked by the visitor gets a notification which is send by the robot and according to the notification the requested person must instruct back to the robot whether he/she is free to meet the visitor. The robot can then guide the visitor (if the concerned person is free) to the concerned person to his/her cabin. The robotic receptionist captures an image of each and every visitor to keep a record of the visitors and to whom they wanted to meet.



II. LITERATURE SURVEY

[1] In this demonstration, a humanoid robot interacts with an interlocutor through speech and gestures in order to give directions on maps. The robot is placed behind a receptionist desk with a map of the university campus (or floor plan) waiting for potential interlocutors. Visitors can approach the robot and ask it in which direction to find places certain. Speech and also deictic gestures to locations on the map between them can be used as a reference for the inquiry. The robot in all cases uses both speech and gesture in its answer to indicate the correct direction to the visitors. The proposed demonstration is an example on how to successfully enhance a robot with social interaction strategies in the domain of spatial awareness for a better user experience during human-robot interaction. Aside from the demonstration session, the robot could also be installed at the conference front desk to serve the conference participants to find their way to the next talk.

[2] Most social robot project have worked to create system that recognize and exhibit human emotions. However, the range of capabilities exhibited by these robots is typically discovered and exhausted by people rather quickly, and such robots do not maintain their users' interest over the long term. This is problematic for a robot that is situated in an environment for a long time. The authors propose that endowing such a robot with personality, character, and a story that changes over time will keep people interested enough to provide the robot with a steady stream of visitors.

[3] Robots are possible candidates for performing tasks as helpers in activities of daily needs in the future: working as a receptionist is one possible employment. However, the way the receptionist robot should appear or sound and behave needs to be pump carefully, in order to design a robot which is accepted in a positive way by normal people. This paper describes a study on anthropomorphism of a receptionist robot made for users depending on the appearance and the voice of the receptionist. The motivation for this research is to investigate how a receptionist robot should be designed to be employed. Receptionists do a task that is useful as support for common people in everyday life: a task that can potentially be performed by conversational agents as well as robots.

[4] This paper covered the design and implementation of three of the receptionist robot's software modules: navigation and localization, face detection, and people detection. It detects and approaches people passing by its surrounding area, offering its services. Human-robot communication can be established orally or by means of a tactile interface. If necessary, the robot is capable of guiding visitors anywhere on the floor. The receptionist robot project is composed of two separate theses. Apart from the receptionist's conception and system design, which is common to both, this paper focuses on the robot's navigation and localization module, as well as on all the modules that employ image processing, which are the face detection, and the people detection modules.

[5] In light of the direction in integrating artificial intelligence and robotics into tourism and hospitality operations, two studies were performed to achieve this objective. A laboratory experiment using measurements of automatic emotional reactions via biosensors and an online survey. Two types of robotic responses were taken, NAO for check-in and Relay for room delivery, were tested. Study of NAO demonstrated that consumer enfold to embrace hotel service robot is influenced by human-robot intercourse dimensions of



anthropomorphism, perceived intelligence, and perceived security. Differences were found between NAO and Relay: NAO's adoption depends on anthropomorphism and perceived security, while Relay's on perceived intelligence and significance of service operation in hotel experiences. The other study discloses the support for the significance of anthropomorphism and behold security in NAO, as reflected in galvanic skin response (GSR) peaks during sequences of interactions and fixation on NAO's face. Support for apprehend intelligence in Relay was also identified. Implications for the hospitality industry are provided.

III. SYSTEM DESIGN

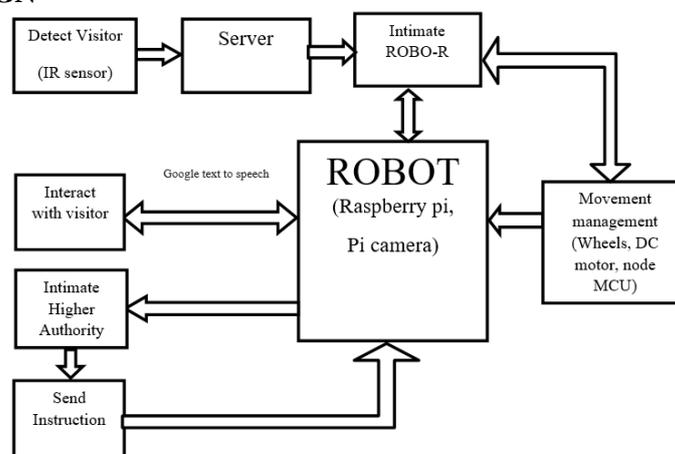


Fig. 1. Block Diagram for Robotic Receptionist.

A. Detect Visitor

The robot is placed at the reception. When any client comes inside from entrance gate, the detector detects them and sends a signal to the ROBO-R via server. The ROBO-R after receiving the signal moves towards the entrance and welcomes the client.

B. Interaction

Once the visitor enters the office, ROBO-R makes them to sit and starts interacting with them. It takes the input from the client in a tablet or a screen attached to the ROBO-R. Based on client's query ROBO-R intimates the concerned person. Once the concerned person gets the notification in his android phone, he can send the instruction to ROBO-R. Based on the instruction from the concerned person, it conveys the message to the client. ROBO-R captures the image of all the client with their details and then transmits it to database.

C. Movement

Each department consist of different routes and each route contains several points. Based on the instruction, the ROBO-R selects a particular route and follows the same. It starts from the first point of the route and moves towards next point on the same route. It changes the direction from a point while moving towards the next point based on the predefined instruction.

D. Second Visit

As mentioned, the ROBO-R captures the facial image of each client along with their details and stores it in the database. During the second visit of the client, the ROBO-R captures the facial image of client again and send it to its database. The image is then processed for its comparison with gray image using face recognition algorithm. If match is found, it retrieves the previous visit information and based on that it starts interaction.



E.Hardware

The hardware components include the following:

- Acquisition Device: Responsible for capturing and used for face detection and face recognition. Here, we use pi camera as the acquisition device. And a IR sensor is used to detect human movements.
- Processing device: The main computer itself, with raspberry pi 3, node MCU and arduino is responsible for running software that allows the processing and movement of robot and to do the required tasks.
- Display and Hardcopy Devices: Responsible for displaying the contents for human viewing. It includes color monitor and android phone.

F.Software

The software portion of robotic receptionist consists of modules that perform specialized tasks. NetBeans a multi-platform for java and python. Android studio, an open platform to build android applications required for normal or complex purposes. Navicat MYSQL is the database building software that is being used in the project. Arduino IDE (integrated development environment) software is a cross-platform application used to write and upload programs to Arduino compatible boards.

IV. RESULTS AND DISCUSSION

Step I: Client fill their details (such as name, contact number, email id, department they want to visit, purpose of visit) in the registration form.



Fig 2: Client registration page

Step II: Successful registration of client details in data base and also it should be sent to higher authority.

id	name	email	mobile	dept	message	time	status
1	null	palabborghavan4@gmail.com	8879401527	HR	the whats up	Apr 17, 2019 5:42:39 PM	pending
2	null	manbhuvan05@gmail.com	8879401527	Accounts	open	Apr 17, 2019 5:51:28 PM	pending
3	null	gishvnd@gmail.com	8879401527	HR	hi	Apr 17, 2019 5:51:48 PM	pending
4	null	palab@gmail.com	8879401527	HR	hi	Apr 17, 2019 5:54:12 PM	pending
5	null	palajpa@gmail.com	8879401527	HR	hello	Apr 17, 2019 5:56:11 PM	pending
6	null	manbhuvan05@gmail.com	8879401527	Accounts	hello	Apr 17, 2019 6:17:38 PM	pending
7	visu	manbhuvan05@gmail.com	8879401527	Accounts	heeee	Apr 17, 2019 6:20:17 PM	allow
8	visu	manbhuvan05@gmail.com	8879401527	Accounts	heeee	Apr 17, 2019 6:23:13 PM	pending
9	visu	manbhuvan05@gmail.com	8879401527	Accounts	heeee	Apr 17, 2019 6:37:35 PM	pending
10	visu	manbhuvan05@gmail.com	8879401527	Accounts	heeee	Apr 17, 2019 6:38:41 PM	pending
11	manr	manr@gmail.com	9886832424	HR	hello	Apr 17, 2019 6:46:29 PM	pending
12	manr	manr@gmail.com	9886832424	HR	hello	Apr 17, 2019 6:46:51 PM	pending
13	palab	manr@gmail.com	9886832424	HR	hello	Apr 17, 2019 6:56:10 PM	pending

Fig 3: Client database



Step III: To capture the photo of the client and upload it to Server.



Fig 4: Client photo.

Step IV: The message needed to be sent to the concerned person with a required ID.

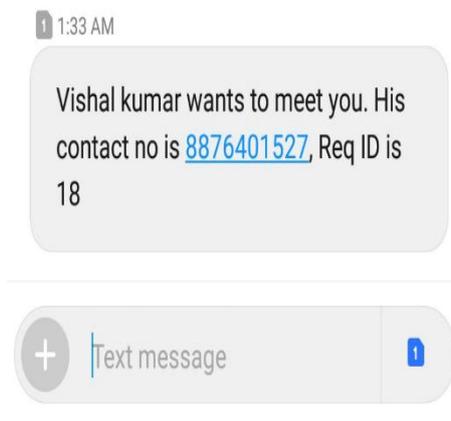


Fig 5: Request ID

Step V: The client details should be reflected on employee's end.



Fig 6: Authority response



Step VI: The robot assists the client to the concerned authority cabin.



Fig 7: ROBO-R assistance.

VI. CONCLUSION AND FUTURE SCOPE

The present context of work has brought out an application of robotic receptionist. This project addresses the issues, disadvantages of the primitive systems for receptionist and application oriented management system. This project is simulated in the first phase. With this project implemented, there will be change in the outset of applying any technology according to its efficiency and reliability. This project proves to be working efficiently, cost effective and with low power features. This model is scalable infinitely and can prove the extensibility of the application.

Various applications of this project include

- Keeping a record of clients that visit the office.
- Guiding the clients to the respective concerned departments.
- Informing the concerned departments about the clients and fixing a meeting with them.

Future scope includes:

- The project can be further extended to be able to recognize and detect human with 100% accuracy.
- Humanoid structure can be built to make the robot more user friendly.
- More hardware can be installed such that it is able to feed a live video of the client to the concerned person.
- Other industries can be explored such as hotel industries, ware houses to keep record of items, in hospitals to have a full record of the patients etc.

VII. ACKNOWLEDGMENT

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