An office Robot Receptionist using Artificial Intelligence

B G Ramya
UG Student
Department of CSE
Sri Sairam College of Engineering

Chaitra N
UG Student
Department of CSE
Sri Sairam College of Engineering

Piyush Rai D
UG Student
Department of CSE
Sri Sairam College of Engineering

Murali A
UG Student
Department of CSE
Sri Sairam College of Engineering

Guided by: Mrs Shalini K V
Assistant professor
Department of CSE
Sri Sairam College of Engineering

Abstract:

While many researchers are investigating human-robot social interaction, one area that remains relatively unexplored is that of continued long-term interaction. The Roboceptionist (“robot receptionist”) Project, part of the Social Robots Project, is investigating how a social robot can remain compelling over a long period of time—days, weeks, and even years. Intelligent robots will make a chance for us to use a computer in our daily life. We implemented a robot, ROBOR, a company reception desk for the computerized guidance. Computers are getting to be indispensable nowadays. Most of us, however, do not think they are friendly enough. Intelligent robots will make a chance for us to use a computer in our daily life. We introduced a robot “ROBOR” for the computerized company reception desk. The character we have designed, named ROBOR, is built from a mobile base with a moving flat-panel monitor mounted on top, which displays a graphical human-like face. ROBOR remains stationary inside a small booth near the main entrance. Once gets the signal of visitor in the office. ROBOR can interact with the visitors and welcome them and make them to sit. ROBOR can ask the visitor the purpose of the visit and intimate the message to the concern person and waits for the response from the concern person.

Introduction:

These days, research and development of multiple interaction-oriented robots have been frequently observed. These robots are expected to interact with human in daily-lives or office-spaces. Since it is said that non-verbal medium are important for realization of smooth communication, most of these robots try to share information with human through not only verbal communication but also non-verbal communication such as a glance, a nod, and gestures. However, these robots are immediately recognized as robots because of mechanical appearance. On the other hand a few robots that have human-like appearance are developed, and they are called android-robot. Kobayashi tried to realize natural facial expressions because facial expressions are said to be playing the most important role in face-to-face communication. Oh also make realistic face robot with special skin material called “Frubber”. Ishiguro developed whole body type android robots by ordering to a company. They tried to generate natural behaviors and motions of the robot. In addition, they try to evaluate humanity of android robots in cognitive science perspective. The greatest asset of android robots is that they give us a strong feeling of presence as if we communicate with real human. Therefore it seems that android robots bring human-robot communication close to human-human communication, while robots with mechanical appearance lack the ability to express human-like
behaviors in particularly non-verbal communication.

**Objective:**

The main objective of the project is to create a robot that can provide useful services, but that also exhibits personality and character. The robot will be designed for ease of interaction without requiring any training or expertise, and to be compelling enough to encourage multiple visits over extended periods of time.

**Existing System:**

A number of other research groups are also using robots to explore social interaction. Kismet and Sparky both used facial expression and movement to interact with humans. Unlike Valerie, these robots engaged in only short-term, nonverbal interactions, and their purpose was not to provide users with useful information. On the other hand, a number of robots have been designed over the years to serve as tour guides for museum visitors. Like Valerie, their purpose is to inform as well as to entertain. These robots also use speech capabilities to provide users with useful information, and they use facial and emotional expressions to improve the quality of interaction. However, these interactions are fairly structured and primarily one-way—people do not actively converse with the robots. The Nursebot is another robot that uses social competence to improve task performance.

**Problem Statement:**

In the current system we have a human being as a receptionist. For the receptionist is become a burden to remember every task and every visitors. They need to remember them very well and the conversation regarding the last visits.

**Proposed system:**

We have proposed a robotic receptionist which can do the job of a receptionist in an office. Robotic receptionist can sense the visitor or customer and welcomes them once they reach the office. The receptionist is fitted with a Raspberry Pi and HD camera and we have used artificial intelligence into it. The receptionist can make the guest sit in the reception and interact with them. The receptionist welcome the guest and ask the guest the purpose of the visit and based on that it sends a request to the concern person. The requested person gets the notification into the Android phone and can send the instruction to the receptionist. The receptionist convey the message to the guest. The guest can follow the receptionist to reach the concern person. The receptionist can capture the image of each and every guest and welcomes automatically from the next visit.

**Advantages:**

- Cost efficient
- Updated technologies
- Easy to manage the guest’s records
- Keep a record of the conversation with the guest

**Hardware requirements:**

- Processor: Any Processor above 500 MHz
- RAM: 2 GB
- Hard Disk: 80 GB
- Android Phone
- Raspberry pi 3
- IR sensor
- DC Motor
- Stepper Motor
- Camera

**Software requirements:**

1. Operating system: Windows 7
2. JDK 1.8
3. Android SDK
4. IDE: Eclipse Kepler
5. Data Base: MYSQL
6. Server: Apache Tomcat Server 7.0
7. Database Connectivity: JDBC Sources (with MYSQL Server)
8. Programming Language: Java and Python
**Impact:**

The proposed robot can provide a new era of modern office where it makes the office reception attractive and provide good impression to the visitors. It uses the modern technologies and social interaction.

**Modules:**

1. **Detect Visitor**
   
The Robot is placed in the reception. When any guest comes inside, the detector detects and send signal to the ROBOR. As soon as the ROBOR receives the signal, it moves towards the entrance and welcomes the guest.

2. **Interaction**
   
   Once the visitor enters the office, ROBOR makes them sit and start interacting with them. It takes the input from the guests and the speech of the guest is converted into text using google TTS and applies NLP. Based on guest’s query ROBOR replies and intimate the concern person. Once the concert person gets the notification in his android app, can send the instruction to ROBOR. All the conversations are stored in the server. Based on the instruction from the concern person it convey the message to the guest. ROBOR captures the image of all the guest with their details and transmit to the server.

3. **Movement**
   
The department consist of few routes and each route contains several points. Based on the instruction, the ROBOR selects a particular route and moves in the route. 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.

4. **Second Visit**
   
   As the ROBOR captures the face images of each guest along with their details in the server, when the guest visits the office again, captures their image and send to the server. In the server, the image is processed and apply the face recognition algorithm. If matches found, retrieve the previous visit information and based on that starts interaction.

**Architectural Diagram:**

**Conclusion:**

In order to design a receptionist robot, we conducted a preliminary survey about the expectation of people regarding the attributes of a receptionist, and an experiment of human robot interaction. The experiment consisted in inviting people to interact with receptionist robot. Voice was also manipulated, as it could sound human or robotic. In the flow of the experiment, both receptionists gave directions to the participants to reach certain rooms. Results indicate that the agent tends to be more anthropomorphised and to be seen less uncanny. Voice type seems to be correlated to uncanniness too. Future works include doing further analysis on communication types of the receptionists and investigating the effect of exposure to technology on the perception of the receptionists.
Reference:


