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A Cognitive Privy Humanoid Robot

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Abstract — According to the robotics ethics, the robots can able to complete the different tasks without help of any external activities. It must include the logical thinking knowledge, own decision making characteristics and multiple sensing capabilities. According to these qualities our robot having the logical thinking algorithm, good decision making supports and multiple sensing equipment's such that sights, hearing.. Using these features it can replacing a personal assistant work such that message passing, goods delivery and receptionist works.

Keywords— Humanoid robot, self knowledge, autonomous decision making.

I. INTRODUCTION

Artificial Intelligence (AI) is a general term that implies the use of a computer to model with intelligent behaviour. Research in AI focuses on the development and analysis of algorithms that learn and/or perform intelligent behaviour with minimal human intervention.An AI is a computer program designed for tasks normally requiring human intelligence (a human's ability to learn), while a robot is a machine that completes complex tasks. An AI could be used to control a robot, but they are very different. Using this intelligence behavior a robots are complete the complex tasks. Its comes under the robotics with AI.

II. RESEARCH

A robot that helps you with day-to-day household tasks, making your life easier. These little in-home companions serve a variety of purposes: everything from educational assistance to schedule organization. They are designed to take the daily tasks that make your life more stressful off your hands, like trying to remember upcoming appointments or birthdays! There are six main types of industrial robots: Cartesian, SCARA, cylindrical, delta, polar and vertically articulated. However, there are several additional types of robot configurations. Each of these types offers a different joint configuration. The joints in the arm are referred to as axes.

2.1. Articulated - This robot design features rotary joints and can range from simple two joint structures to 10 or more joints. The arm is connected to the base with a twisting joint. The links in

the arm are connected by rotary joints. Each joint is called an axis and provides an additional degree of freedom, or range of motion. Industrial robots commonly have four or six axes.

2.2. Cartesian - These are also called rectilinear or gantry robots. Cartesian robots have three linear joints that use the Cartesian coordinate system (X, Y, and Z). They also may have an attached wrist to allow for rotational movement. The three prismatic joints deliver a linear motion along the axis.

2.3. Cylindrical - The robot has at least one rotary joint at the base and at least one prismatic joint to connect the links. The rotary joint uses a rotational motion along the joint axis, while the prismatic joint moves in a linear motion. Cylindrical robots operate within a cylindrical-shaped work envelope.

2.4. Polar - Also called spherical robots, in this configuration the arm is connected to the base with a twisting joint and a combination of two rotary joints and one linear joint. The axes form a polar coordinate system and create a spherical-shaped work envelope.

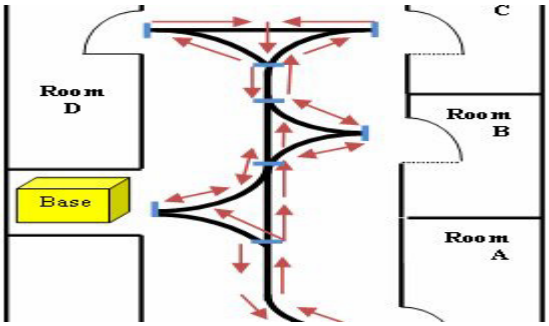
2.5. SCARA - Commonly used in assembly applications, this selectively compliant arm for robotic assembly is primarily cylindrical in design. It features two parallel joints that provide compliance in one selected plane.

2.6. Delta - These spider-like robots are built from jointed parallelograms connected to a common base. The parallelograms move a single EOAT in a dome-shaped work area. Heavily used in the food, pharmaceutical, and electronic industries, this robot configuration is capable of delicate, precise movement.

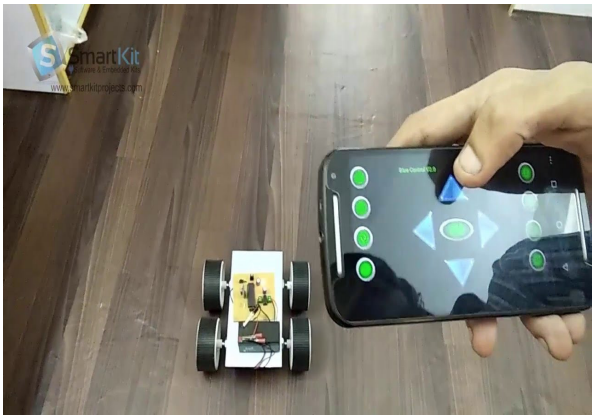
And another major type is humanoid robot. It looks like as a human. It having a senses like that sight, hearing, smell, taste and touch. To this project implementing the multiple senses in humanoid robot.

IV. EXISTING SYSTEM

By the previous research, we gather the information that the robotics is developed step by step. Firstly the robot are use to make a movement using the line mapping i.e. The robot contains the IR sensor and it use to detect the black line to make the moment the image for line mapping are below



On the above diagram we may see the black line drawn for the robot path. If the robot needs to move from Room A to the BASE using the black line it moves to the base. This line mapping based robot has some disadvantage like the robot can't identify the correct path it moves towards the entire path where there is a black line and the correct path is not identified by robot at a time.



After line mapping method the device based robot are developed. In this device based robot each command has to be intimated through the mobile app or pc while the robot and the device are connected through same Wi-Fi network or Bluetooth. This robot can run using the android app which is developed manually while the button on the android app is clicked as go left the move towards left of it. The disadvantage of this device based robot is we need to command each and every task. like go left

and go right and etc,. And also the Wi-Fi network has to strong.

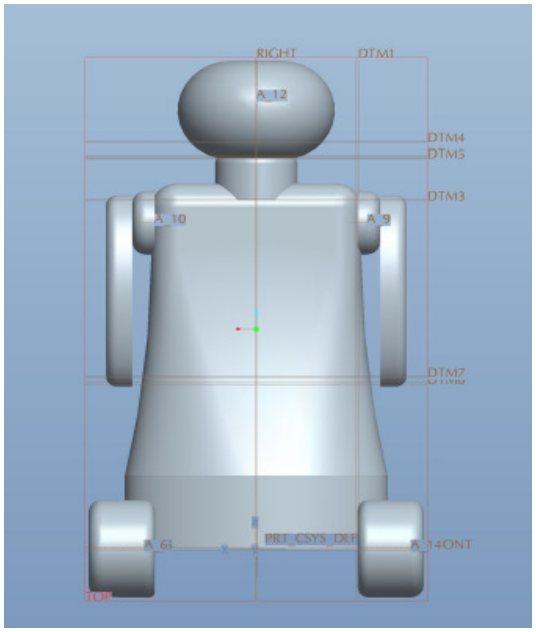
At last the voice based robot is developed it also developed using android app but in this we need to speak the command neither we need to press the button or need to type to run the robot. The robot can be run through the voice command if we command go right through the voice it move towards the right and so on. We undergo some GPS concept to move the robot by making its own path to attain the destination. And also we undergo the face detection, voice recognition and etc.

V. PROPOSED SYSTEM

The robot which has to perform the tasks and to make a decision with its intelligence. This model does not need any kind of mobile application. It can be communicate with human through voice in a proper manner. This overcomes from the usage of LCD display. It tracks our surrounding paths with GPS to deliver the goods from one place to another. It's also recognizing the voice and face of humans for the interactive session in it. Using GPS module SKG13.It retrieves the coordinates from the satellite positions. It control by Arduino depends upon coordinate, the robotics navigate automatically from source to destination. It uses live streaming programming concepts for live telecasting environment.

VI. IMPLEMENTATION

An implementation starts form making the robot structure; here we choose the 6mm stainless steel rod for the body construction. Stainless steel is weight less material, Corrosion resistance and Ease of fabrication. So it convenience for our work. The 3 dimensional structure as below.



After the body construction the action and movement control was proceed. Here the components like Arduino UNO, Motor Shield and HS-04 ultrasonic sensors are used.

Using the GPS module taking the latitude and longitude values for the particular environment. With help of these coordinates we are developing a custom maps for particular environment. After the mapping works we coined the places on the map. Once the robot entered to the coined places it will identify that it's the current location on the particular environment. So that when we intimate the destination location, it will decide the shortest path to obtain the destination. If any obstacle are present while the time of travelling the robot can detected using the ultrasonic sensor. The destination location instruct to the robot using the voice command. Because it can recognize the human voice for communication. And it also response through the voice.

VII. SYSTEM SPECIFICATION

A. Arduino Uno: ATMega328P the Arduino Uno is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter. The Arduino Uno has in built ADC components and can process both analog and digital signals. The Atmega328 has 32 KB of flash memory for storing code (of which 0.5 KB is used for the bootloader). It has also 2 KB of SRAM and 1 KB of EEPROM. The Arduino Uno has an operating voltage of 5V; a recommended input of 7V-12V can be applied to it. However, the Arduino Uno does not have a current driving capacity to drive all the DC motors attached to it- thereby requiring an intermediate motor driver circuit. Each of the 14 digital pins on the Uno can be used as an input or output, using pinMode(), digitalWrite(), and digitalRead() functions. Each pin can provide or receive a maximum of 40 mA and has an internal pull-up resistor (disconnected by default) of 20-50 kOhms. The Bluetooth interface to the Arduino is achieved with the help of the Serial in-out pins of the Arduino namely: Serial: 0 (RX) and 1 (TX). Used to receive (RX) and transmit (TX) TTL serial data. These pins are connected to the corresponding pins of the ATmega8U2 USB-to-TTL Serial chip. The Arduino Uno is programmed using the Arduino IDE software using a set of C/C++ functions.

B. Motor Shield: Since the DC current of the Arduino Digital I/O pins is found to be about 40mA, the current isn't sufficient to drive all the DC motors directly. By using the t Motor Shield consisting of 3 L298D ICs which are motor drivers, as many as 4 DC motors can be efficiently controlled by the Arduino. The pins of the motor shield can be directly placed on the Arduino Uno board in the form of a stack. An external power supply of 12 V is provided to the motor shield for powering all the motors connected to the shield.

C. DC Motors: The robot utilized two DC motors that drive the two wheels at the front while the two wheels at the back follow the ones at the front. The microcontroller then processes the command and correspondingly, passes a signal to the motor shield for the right motor to move. The electric signal that is sent to the motor is converted to mechanical energy that hence, rotates the shaft of the motor. The wheel attached to the shaft of the motor then rotates, producing a linear forward or backward motion of the robot. Two 150 rpm motors were used in this system that is powered by a total of 12V supplied to the motor shield.

D. GPS Module: The Skylab SKG13 series is a complete GPS receiver module that features super sensitivity, ultra low power and small form factor, and a complete serial data message with position, velocity and time information is presented at the serial interface with NMEA protocol.

VIII. CONCLUSION

The prototype revealed the simplicity of an intelligence based system such as the humanoid robot. It depicts how control mechanism can be obtained without having to use any other control mechanism such as buttons or joystick. By improving the voice reception and inducing further commands, the devices can be automated to the fullest.

IX. REFERENCE

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