CONTROL OF ROBOS AND OBJECT DETECTION USING VOICE AND VIDEO

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ABSTACT

This paper is based on audio commands i.e. commands given to the robot by the user speech. This concept is based on voice controlled robot was to give instruction by voice and the robot performs the task according to the commands. The language input allows a user to interact with the robot which is familiar with the people. The main advantage of speech activated robots are hands-free and fast data input operations. It is a robot which takes speech input as commands and performs some navigation task through a distinct man machine interaction. The complete system consists of three subsystems, the speech recognition module, a central controller and the robot we have studied the various factors such as noise which interferes speech distance factor and recognition .The results prove that proposed robot is capable of understanding the meaning of speech commands.

INTRODUCTION

A **robot** is a mechanical or virtual intelligent that can perform command automatically or with guidance, typically by remote control. In action a robot is usually an electro- mechanical machine that tells through computer and electronic programming. Robots are used in an increasingly wide variety of tasks such as mowing lawns, vacuuming floors, cleaning drains, building cars, in warfare, and in tasks that are too expensive or dangerous to be performed by humans such as exploring outer space or at the bottom of the sea.

Voice Controlled Robot (VCR) is a robot whose motions can be controlled by the user by giving specific voice commands by using speech recognition module. Voice based robotic control, mainly used for industrial and surveillance applications. It provides concept of controlling a robot by a voice instruction. Robot as the ability to synthesizing human speech for communication. A voice recognition unit built around a high speed processor that make sure various operations of the system to be performed by voice command. A few of commands recommended for the operations are listed as: START, STOP, FORWARD, REVERSE, RIGHT and LEFT.

SPEECH RECOGNITION MODULE

The speech recognition software is speaker dependent and speaker independent. The extra feature of the application is the ability of the software to train itself for the voice commands. The GUI running along with the software provides a very convenient method for the users to train. It processes the signal and recognizes the voice command and moves the robot according to the command i.e. "Forward", "backward", "right", "left". The robot waits for the trigger word and then performs the operation according to the commands.

GRAPHICAL USER INTERFACE (GUI)

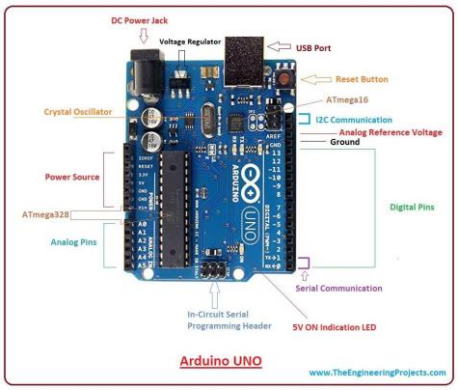
The main objective of the GUI is to provide a user friendly Interface which integrates all the required functional. It facilitates all phases of voice recognition algorithm including acquiring voice samples,and finally running voice recognition process in real time.

PROJECT DESCRIPTION

Voice controlled robot is a robot which performs action according to the intractor voice commands. Here we have used Adriano Uno as a microcontroller, EasyVR which is speech recognition module and nrf24l01 for wireless transmission. Easy has built in speaker independent commands for ready to run on basic controls. The commands are processed by the Arduino Uno and then transmitted over nrf24l01 module. At the receiver side the nrf24l01 receives the signal and then it performs the operation according to the commands. The camera continuously gives the video of the surroundings of robot at the senders screen so that it can show the present location and environment where the robot is present at that time. The robot sends the distance of the object to the sender's side and can perform the action according to the voice commands given to it at that moment.

HARDWARE DISCRIPTION

Arduino is an open-source electronics prototyping platform based on flexible, easy-to-use hardware and software It receives input from a variety of sensors and can affect its surroundings by controlling lights, motors, and other actuators. This Arduino is a microcontroller board based on the ATmega328. The Arduino has a 14 digital input/output pins, 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power Jack, an ICSP header, and a reset button. The maximum length and width of the Uno PCB are 2.1 and 2.7 inches respectively, with the USB connector and power jack extending beyond the former dimension. Four screw holes allow the board to be attached to a case. The Power source of the Arduino can be done by an external power supply or via the USB connection. External power supply can come either from an AC-to-DC adapter or battery. Leads from a battery can be inserted in the Vin pin headers of the POWER connector and Gnd. With an external supply of 6 to 20 volts board can be operated. If supplied voltage is less than 7V, though the 5V pin may supply less than five volts and the board may be unstable. If the usage of Arduino is more than 12V, the voltage regulator may overheat and damage the board. The recommended range of voltage is 7 to 12 volts. Each pins in the Arduino Uno can be used as an input or output. They operate at a voltage of 5 volts. Each has an internal pull-up resistor of 20-50 k Ohms. The storage of ATmega328 has 32 KB. Arduino Uno also has 2 KB of SRAM and 1 KB of EEPROM.



SOFTWARE DISCRIPTION:

An **integrated development environment** (**IDE**) is a software application that gives comprehensive facilities to computer programmers for software development. An IDE normally
Consists of:
It contains compiler, interpreter, or both, such as
Microsoft Visual Studio.This program typically has many features for authoring, modifying, compiling, deploying and debugging software. The aim is to abstract the configuration necessary to piece together command line utilities in a cohesive unit, which theoretically reduces the time to learn a language, and increases developer productivity. The software for Arduino can be downloaded from Arduino homepage i.e. www.arduino.cc The Arduino Uno can be programmed with the Arduino software. The ATmega328 on the Arduino Uno comes with a boot loader that allows you to upload new code to it without the use of an external hardware programmer. It communicates using the original STK500 protocol. For connecting and configuring the EasyVR we need to download the software EasyVR commander. One can use the latest version of EasyVR commander i.e. EasyVR commander 3.2.5 for configuring and programming transceiver module we can use RF 24 library.

SPECIFICATIONS

The relationship between torque Vs speed and current is linear as the load on the motor increases, Speed will decreases. As long as the motor is used, the high efficiency, long life and good performance can be expected. If voltage is applied continuously to the motor in a locked rotor condition, the motor will heat up and fail in a relatively short time. A motor's basic rating point is slightly lower than its maximum level. Load torque can be measured by the current drawn when the motor is attached to a machine whose actual load value is known.

APPLICATION

The security cameras are becoming more and more popular in the consumer market, being a cost-effective way to have a comprehensive surveillance system installed in a home or business for an often less expensive price. Cameras are also supreme for people renting homes or apartments. The security camera is also a great option for seasonal monitoring and surveillance.

CONCLUSION

In this project we can use speaker dependent and speaker independent command and the robot starts function as the trigger word spoken. It performs the tasks as command given by the user in this project we have planned to use the five words accuracy would be around 95 % because of the too much noise it may not detect the command. Signal power concentration vary by user to user.

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