

README

CS101 – 2015

Course Project

Project : Voice Controlled Bot

The objective of this document is to help someone else run the code that is delivered as part of this project.

Permanent Github repository link

- <https://github.com/siddharth140040051/cs-101-final.git>

Video Links.

- Link to Setup video: <https://youtu.be/iVbtm2EMOgM>
- Link to Demonstration video: https://youtu.be/rU_em5TrlZQ

Project Title: Voice Controlled Bot

Students:

Name	Roll No.	Email
Siddharth Keshan	140040051	siddharthkeshan@gmail.com
Mohit Patel	140040010	tompatel17501@gmail.com
Vineet Moghe	14D070020	vineetmgh@gmail.com
Mayank Raj	140040050	mnkrj500@gmail.com

Project Description

This project encapsulates the work done by the team for the embedded system project of the second semester CS101 course academic year 2014-2015. The project is a voice controlled bot in which the command is directly sent through serial port using MATLAB. Sending command through the keyboard wirelessly to the bot can be done both through MATLAB as well as through X-CTU.

Project Objective

This project aims at developing a voice controlled environment for Firebird V so that it can perform various tasks by simple verbal input . As we all know many disabled people face a lot of difficulty in day to day movements. Hence this idea has wide applicability and scope for solving a real life problem by extending to make voice controlled chairs.

Users of this product will use the interface to initialize the system and monitor it.

The achievements are as follows:

- Voice processing based on verbal input by the user using MATLAB.
- Automated detection of obstacles by the robot using sharp sensor and give beep alert.
- Real Time data transfer from user to bot after processing through ZIGBEE.

Hardware Platform

1. ZigBee wireless communication interface on both robots and the server.
2. Headphones attached to laptop.
3. Sensor mechanism on the robot to detect obstacles.

Software

1. MATLAB; for voice processing
2. ATMEL STUDIO 6 :for programming the robot.
3. AVR BOOTLOADER : to burn the program on bot.
4. X-CTU : to establish ZIGBEE connection

Code Description

Filename	Purpose	Executes on
wireless.c	Main Program	Robot
filter.m	Matlab file to filter the voice command	Centralised Server (PC)
Voiceinput.m	Matlab file to input ,process , compare and send command to port	Centralised Server (PC)
parameter.m	To send a argument to bot.	Centralized server(PC)

Deliverables

Folder	Contains
c code	Source code of programs to be burnt on Robot.
matlab code	Contains Matlab files.
Documents	Contains Project related documents.

Execution Instructions

The following steps must be performed in order to run the code provided.

1. **Setting up the hardware on the robot :** The project requires certain specialized hardware . Firebird V with ATMEGA 2650 microprocessor and a obstacle Sensor. The Obstacle Detector is a Sharp Sensor, that is attached at the front of the robot pointing front. This detects the presence of obstacle immediately in front of the robot.
2. **Setting up the voice processing hardware:** Attach a headphone.
3. **XBee:** Connect a XBee module to both the firebird, and the base station. Configure them properly so that they can communicate with each other.
4. Download the file cs_project.tar.gz, and extract it into a suitable folder.
5. Open the SOURCE folder to find the related programs.
6. Open AVR Studio 6, and create a New Project in it. Import the C-files from the folder into this project. Place wireless.c as the main file .Compile the code with all default options for the Firebird (refer the Firebird Manual for more details).
7. Burn the hex file formed onto the robot using the AVR Bootloader programmer. You can also use the Hex file submitted by us. Now the Firebird is ready to use.
8. Open matlab, and run the file voiceinput.m in it. On the Matlab terminal, enter the new address of yhe default voice commands attached with the document. Also attach the ZigBee module and change the COM PORT address.
9. Once the matlab code is also set up, the robot is now ready to run. The Matlab code will give it suitable instructions to move in appropriate directions(using XBee), as per the voice input by user. .
10. You are now ready to go to order a bot.
11. Please check the video links below.