CS308 README



CS308 – 2011 Project

Autonomous Target Acquisition & Engagement

**Project Title:** Autonomous Target Acquisition & Engagement

**Students:**

|  |  |  |
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**Project Objective**

The bot first scouts the Arena for targets and then when it finds a target it aims for the target and then it tracks the target at as soon as it is able to shoot the target it shoots a laser pulse at the target. It then shows us a recorded image containing the point of impact of the laser pulse and the centre of the target and the target so that we can can be satisfied of its accuracy.

The Target Specifications are:

1. The target has a minimum area of 30cm2.
2. The target is of blue in colour.
3. The target has to stay above the camera of the bot.
4. The target has to move slowly after the bot finds the target.

**Hardware Platform**

1. Firebird V ATMEGA2560
2. Two servo motors.
3. One USB Camera.
4. One laser pointer.
5. Serial port communication

**Software**

1. AVR Studio 4
2. Matlab 2008.
3. IBALL web cam driver

**Code Description**

Code Files.

|  |  |  |
| --- | --- | --- |
| Filename | Purpose | Executes on |
| group6.c | Main Program | Robot |
| Detect.m | Identification of the target and giving commands for shooting etc. | PC. |

**Deliverables**

|  |  |  |
| --- | --- | --- |
| Filename | Contains |  |
| C-code.tar.gz | SourceCode of programs to be burnt on Robot.  Contains documentation of the code as well. |  |
| PC-interface.tar.gz | Contains Matlab files. |  |
| Documents.tar.gz | Contains Project related doc files. |  |

**Execution Instructions**

We must first extract the C-code.tar.gz and PC-interface.tar.gz

and then first create a new project in the AVR Studio 4 and create a new file in it and paste the contents of the file group6.c extracted from C-code.tar.gz into the new file and then change the frequency of the project as 11059200Hz and then change compiler optimisation to –Oo and then build the project and connect programmer and charger to the bot and computer and power-on the bot and flash the bot with hex file generated with options as ATMEGA 2560 and mkII. And then connect serial port to both bot and computer. Then install iball web-cam driver. And then connect webcam usb wire to computer. Then find the com port of the serial communication and change the code in detect.m at line no. 11 to the com port found then open matlab and run the detect.m code.

Now the bot starts scouting once it finds a blue targets it fallows it and shoots it and displays the image as proof.

**Coding Guidelines**

Please find attached a zip file with this document. Please refer to this code to write your own code.

Important parts to be taken into consideration.

1. Use the standard “Copyright statement in your code declaring the code to be opensource and property of ERTS Lab”.
2. Use the standard header file “winavr\_firbird.h” which will contain all the implementations of core actuations and sensing.