CS684 Documentation



CS684 – 2010 Project

Project: Farmer Assistant Robots

**Students:**

|  |  |  |
| --- | --- | --- |
| Name | Roll No. | Email |
| Mehadi Seid | 09305201 | [meha@cse.iitb.ac.in](mailto:meha@cse.iitb.ac.in) |
| Rajesh Kaushik | 09305020 | [rajkaushik@cse.iitb.ac.in](mailto:rajkaushik@cse.iitb.ac.in) |
| Swanand Kulkarni (Project Manager) | 09305901 | [swanand@cse.iitb.ac.in](mailto:swanand@cse.iitb.ac.in) |

**Project Objective**

One robot scouts the farm for sign of pests, ripening of fruits & signs of diseases. Then it sends this information along with the co-ordinates to the central server, which after analyzing this data, informs the appropriate robot to take action. By appropriate robot we mean that there are different robots which are assigned different actions like spraying pesticides, collecting fruits etc.

**Hardware Platform**

1. Firebird V ATMEGA2560
2. Arm Assembly (consisting of gripper, pulley, 3 servo motors)
3. Zigbee
4. Camera

**Software**

1. AVR Studio 4
2. MATLAB

**Code Description**

Code Files.

|  |  |  |
| --- | --- | --- |
| **Filename** | Purpose | Executes on |
| Arm\_Control.h | Contains the functions needed to control the arm contraption and camera movements. | Worker Robot |
| Worker\_Complete.c | This is the main program for the worker robot. It has functions for controlling the overall actions of the worker robot. | Worker Robot |
| LineFollowerCounter.c | Main program for Scout Robot. Contains all the scout robot logic. | Scout Robot |
| SRI.m | Initiates working of scout robot | PC |
| WRI.m | Commands worker robot to go to the position where object is found and collect that object. | PC |
| Central\_Server.m | Central Server Code That coordinates the whole work flow. Calls SRI and WRI | PC |
|  |  |  |

**Deliverables**

|  |  |
| --- | --- |
| **Folder Name** | Contains |
| SRC | SourceCode for Worker Robot, Scout Robot, Central Server |
| DOC | Doxygen documnetation, final report, final documentation, Software Requirment Specification |
| BUILD | Hex files for worker and scout robots |
| DEMO | Video for project demo |

**Building Arm Assembly :**

1. Place the gripper in front part of the arm contraption of worker robot.
2. A string attaches the gripper to a servo motor fixed in the upper part of the contraption. This string runs over a pulley.
3. The servo motor with the pulley system fixed in the upper part of the contraption controls the height of the gripper.
4. Camera should be positioned in such a way that it should be able capture image when the gripper is at its default position.
5. With the help of a second servo motor camera should be able to rotate on its right as well as left.

**Execution Instructions**

1. Load the Build/farmerRobot.hex on to the scout robot
2. Load the Build/Worker\_Complete.hex on to the worker robot.
3. Turn on the scout robot.
4. Run the SRC/Central\_Server/Central\_Server .m matlab code on PC.
5. Let the scout robot finish scouting.
6. Turn on the worker robot.
7. Press enter on the central server
8. Wait for the worker robot to collect object.