Project Report

ROBOT CONTROL SYSTEM

Name: Chethan Nagesh Pal

Student Id: 01741616

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**PktParser:**

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| **Module Name** | Pktparser.c |
| **Purpose** | To read the incoming robot packet and extract necessary commands |
| **Task** | ParserTask |
| **Task Priority** | 6 |
| **Queues** | **Parser Queue**: it used to store the buffer address containing the data after the parser task and post to RobotManager  **Framer Queue**: It used to store the buffer address containing the error data and post to framer task |
| **Mailboxes** | None |
| **Semaphores or Mutexes** | None |
| **Data Source** | Serial IO Driver |
| **Data Destination** | RobotMgr, Framer , |
| **Special Data Structures** | None |
| **Shared Data** | None |

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| **Module Name** | RobotMgr.c |
| **Purpose** | To read the data from the buffer fetched from the parser queue and frame the message and send it to Robot Controller through Robotqueue |
| **Task** | RobotManagerTask() |
| **Task Priority** | 3 |
| **Queues** | Parser Queue :It pends on the parser queue until a buffer get posted to this queue from parser task  Robot Queue:it used to store the buffer address containing Robot commands and post to the robotcontroller  Framer Queue:it used to store buffer address containing the acknowledge data and post to the framer queue |
| **Mailboxes** | RobotMailbox:it is used the store the buffer address of either hereiam or stop to the Robotcontroller |
| **Semaphores or Mutexes** | None |
| **Data Source** | Packet Parser |
| **Data Destination** | Robot Controller, Framer |
| **Special Data Structures** | Robotdata: contains the fields of command robotaddress, destination ,position instance ,x and y position which are the characteristics of Robot everytime the command is issued |
| **Shared Data** | None |

**RobotManager:**

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| **Module Name** | RobotCtrl.c |
| **Purpose** | To read the data from the buffer fetched from the RobotQueue and frame the message and send it to Framerqueue. |
| **Task** | RobotControllerTask() |
| **Task Priority** | 1 |
| **Queues** | Robot Queue; it pends on the buffer that is getting posted from the robot manger  Framer Queue;it stores the address of the buffer containing the path of robot and post to the framer task |
| **Mailboxes** | Robot Mailbox (MQueue):it pends on the buffer that is getting posted from the robot manager mail queue containing either hereiam or stop command |
| **Semaphores or Mutexes** | Mutex: it is used protect the critical section like choosing the path which depends upon availability of the floor |
| **Data Source** | Robot Manager |
| **Data Destination** | Framer |
| **Special Data Structures** | Robotdata,  Robotfloor: Contains the fields that is required to represent the robot on the floor  HereIam: Contains the fields that is required to update the particular robot position on the floor |
| **Shared Data** | Path ,floor map:I am checking whether the path requested is being occupied on the floor ,if it is then telling the robot to use the adjacent floors whichever is available and reach the destination |

**Robot Controller:**

**Framer:**

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| **Module Name** | Framer.c |
| **Purpose** | To read the data from the buffer fetched FramerQueue and frame the packet and send to Control Centre |
| **Task** | FramerTask() |
| **Task Priority** | 2 |
| **Queues** | Framer Queue |
| **Mailboxes** | None |
| **Semaphores or Mutexes** | None |
| **Data Source** | Packet Parser, Robot Manager, Robot Controller |
| **Data Destination** | Control Center |
| **Special Data Structures** | Framer: contains the fields that are needed to send to the control centre that is required to update particular robot status |
| **Shared Data** | None |

**Collision Avoidance:**

Used a Mutex for Protecting the step function and particular x and y position on floor map

**Conclusion:**

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| --- | --- | --- | --- | --- |
|  | **COMPLETED** | **PARTIALLY WORKING** | **IN PROCESS** | **NOT STARTED** |
| **Packet Parser** | **Yes** |  |  |  |
| **Framer Task** | **Yes** |  |  |  |
| **Add Robot Command** | **Yes** |  |  |  |
| **Move Robot Command** | **Yes** |  |  |  |
| **Follow Path Command** | **Yes** |  |  |  |
| **Loop Robot Command** | **Yes** |  |  |  |
| **Stop Looping Command** | **Yes** |  |  |  |
| **Collision Avoidance Support** | **Yes** |  |  |  |
| **Double Buffered I/O** | **Yes** |  |  |  |