Robot Arm Industrial Operating File

Its contents:

1- Operations

2- Testing

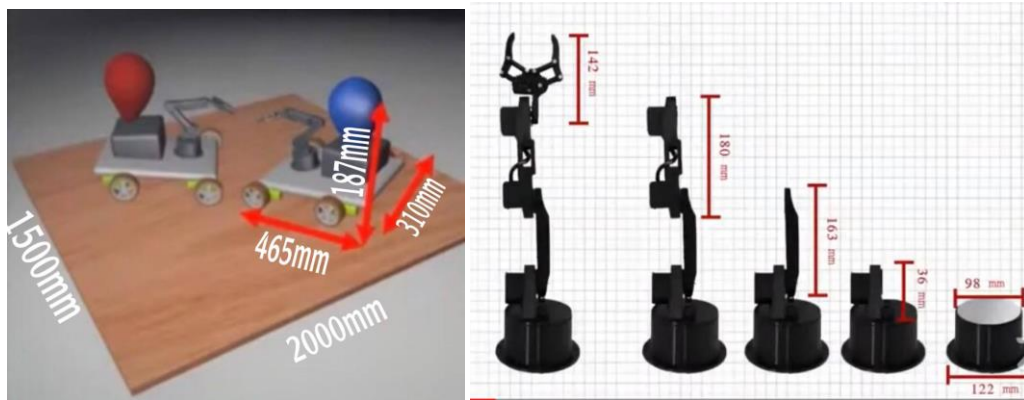*3- Expected errors (Tolerance)*

4- User Manual

5- Warranty

1- Operations

The idea of the Robot Arm project is for two robots to fencing and be controlled completely remotely, as the end of the duel is by popping the balloon of one of the robots and winning the other.

- *Robot dimensions*
- *Robot arm dimensions*
- *The dimensions of the fencing arena*

Depending on the dimensions of the robots, the shape of the fencing arena should be rectangular in order to give the robots enough space for movement

- *Operating Laws*
  - *There must be sufficient distance between the fencing arena and the audience to avoid problems that may occur such as throwing cans into the arena*
  - *Having only one person to operate the robot*
  - *After turning on the robots they are in a state of rest for 10 seconds and then the duel begins*

- remote control

- It is not allowed to use any jamming device such as LED that may cause the sensors of other robots to be disabled

- It is not allowed to change the robot once the duel has begun

- *Control Panel Description*
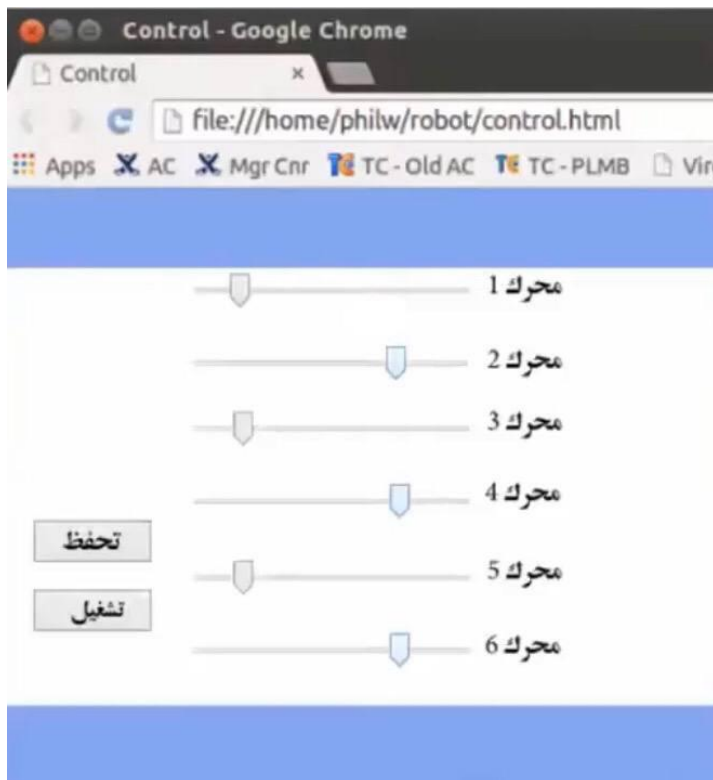
The control interface contains six motors for each special line motor, the angle value is set to 90 degrees, then we save the data on the Database, it is turned on and it is set to On and Off.

- *Technical operation process*

The IOT path begins with the implementation of the first three steps, where the computer is connected to the Internet, the Internet is connected to the server, the server is connected to Database, and Database is connected to the Raspberry Pi . The first three stages give a number and it is stored in the Database. Then the Raspberry Pi can read this number and send commands to the Arduino to move right or left, and it can be received from the camera and analyze the images . The Arduino is connected to two parts, the first part is the arm and the second part is connected to the DCmot, right and left, and either clockwise or counterclockwise.
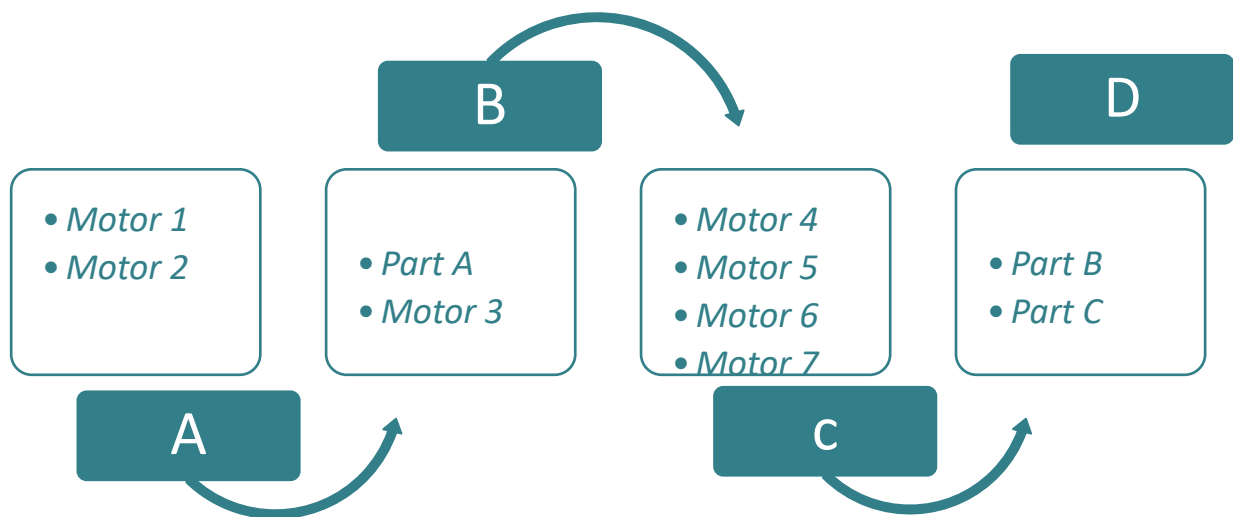
2- Testing

- *Functional Testing*
  - ❖ *Unit Testing*

Works as expected or not?

Motor 1	*Yes*/*No*
Motor 2	*Yes*/*No*
Motor 3	*Yes*/*No*
Motor 4	*Yes*/*No*
Motor 5	*Yes*/*No*
Motor 6	*Yes*/*No*
Motor 7	*Yes*/*No*

❖ *Integration Testing*

B

D

- *Motor 1*
- *Motor 2*

- *Part A*
- *Motor 3*

- *Motor 4*
- *Motor 5*
- *Motor 6*
- *Motor 7*

- *Part B*
- *Part C*

A

C

Motor 1 is connected with 2 after checking that it is working well. It connects with motor 3 and also check that it works. Connect motor 3, 4,5 and 6 together and check that it works and finally connect it with motor 1, 2 and 3 and check that they all work With some.

❖ *System Testing*

Part One "base motor" *Check if DCmot2 & DCmot1 are working* *Done*	*Part Two "The Arm"* *Check the sensors and Motor.* *Done*

<mark>*They work together properly*</mark>

- *Non-Functional Testing*

Performance Testing
Include choosing a good quality battery such as 12V -7AH rechargeable battery

Usability Testing
Experience the user interface and draw the movement of the arm in a specific direction

Compatibility Testing
Including the completion of hardware and electric together

3- Expected errors (Tolerance)

Part name	Expected error
Browser on users computer	-Computer power outage
Internet	- Internet disconnection - The number of users is too many, so it gets stuck
web server	- server pressure
Database	- Duplicate value -Error in the web server connection with Database
Raspberry Pi	- Ros blunders -Error connecting Raspberry Pi to Arduino
Arduino	- Error in the rotation of the link, joint and end effect - Arduino connection error with DC motor
DC mot	- Error connecting it - engine combustion

4- User Manual
[click here](#)

5- Warranty

Warranty Card

This certification extends to a twelve-month span of the prescribed form. This warranty covers repair or placement for a period of time until end of service. Our warranty will be void in case of misuse

SMART METHODS

DATE.........................

By : Eng. Amal AlGethami