**ROBOGAMES 2019**

EVENT NAME: - IARC

*Date: -09/01/2019*

# Team info

Team name: MARK 50

Team leader’s name: Ravindu Iddamalgoda

Contact details of team leader:

Contact no.:+94771150785

Email ID:ravinduiddamalgoda55@gmail.com

Number of members in the team (max 6): 4

***MEMBERS:****(other than leader) 3*

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| --- | --- | --- | --- | --- |
| S.no. | Name | Tech ID | Email ID | Contact no. |
| 1. | Ravindu  Iddamalgoda | 11555 | Ravinduiddamalgoda55@g mail.com | +94771150785 |
| 2. | Ayantha  Shavinda | 12671 | ayanthashavinda8@gmail.  com | +949068355 |
|  |  |  |  |  |
| 3. | Thenula  Ranaweera | 12679 | ranaweerathenula@gmail.  com | +94776916525 |
| 4. | Hasthika Bandara | 12741 | hasthika1020@gmail.com | +94761203259 |
| 5. |  |  |  |  |

# Introduction

Techkrit Robot competition

2019…

INTRO OF COMPETETORS…

We are from Sri Lanka, we compete under IARC there are 4 competitors o Ravindu Iddamalgoda © o Thenula Ranaweera o Ayantha shavinda o Hasthika Bandara We are still schooling.

INTRO OF ROBOT…

Our robot is Mark 50 this is the name we have chosen as the name of the robot. 14 x 15 is the dimension of our robot (it can be change because we are still constructing) o Pololu motors o Pololu sensors

Are the main materials we have used here. We stared our project before 2 months ago.

For this project we have spend 50,000 LKR. And for this incident

We got a good cooperation from our team members, It club and from our school.

OUR AIM…

In this competition we will hope to select to the top 40 and to win the Competition. And please accept our registration and give a chance to compete with the other students.

We will hope that you will give us the chance to compete the competition

Thank you!!!

# CONSTRUCTION

We use for the line following part , we have to detect the black line of the path.In that case we use ir sensor array for detect the line. We use 8 sensor panel array for it. After that we got the analog input of the that sensors and convert it to digital signal and detect the line.Also we have to tell we design own pcb layout for ir sensor array. Then we get the input to the processing unit. We use an Arduino board as the processing board. We use the Arduino mega board because it have many functions and it have many pins. Because of that, we can make our project easily. After tuning the sensor panel we had make the chassis. We design the it and laser cut it from Perspex. It is an simple design.we make it and fix it. then we place sensor panel,Arduino mega board motors, motor drivers power converters , batteries and ect. Then it have a great look. We use pololu 25D high power motors. It have 290 rpm speed and it is 4 mm d shaft motor. Also it have encorder.Ast the motor driver me use pololu VNH5019 motor driver IC operates from 5.5 to 24 V and can deliver a continuous 12 A (30 A peak). It works with 2.5 to 5 V logic levels, supports ultrasonic (up to 20 kHz) PWM, and features current sense feedback (an analog voltage proportional to the motor current). Along with built-in protection against reverse-voltage, over-voltage, under-voltage, over-temperature, and over-current, these features make this product a great general-purpose motor driver.As the battery pack we use 2 lipo battery 11.9 v. we parallel connect two batteries and get more ampere for the bot. then we make the code and line follow the robot.I will explain about in next section.after the line following. We will make the wall following section.for it we use ultra sonic sensors or ir shaps.We still making it.now we are finish the line following section.Now a days we tune the pid values of line following. Foe wall following we have place the ultra sonic sensors in 45 degrees angle for make the robot ways easily. We count distance from ultra sonic value from s = ut mathematical eqalation.and get the distance between the robot and wall. We use m3 screw to fix the component to robot. Those are the construction part of the our mark 50 robot. Here is some pictures of our robot. You can have a better idea of our robot construction part.

https://drive.google.com/open?id=1piLQ9z9dlM1jez6rF7VI5f6nb6Xv7zuJ https://drive.google.com/open?id=1LsgBcMmyzdmlnG-ancOgziOB8utWmYsn https://drive.google.com/open?id=1Wld3mGgOd6xG5fLLmVaP\_tM-5HSEY1Iu https://drive.google.com/open?id=1X5YgMSoNAgyzq2c7t-xWC\_ZLf8SUNxEu

# WORKING PRINCIPLE

Our robot first aim is line following. For it use get the sensor panel values and we calculate the error and make a pid control system. As the error first we make a propotional correction after that we use a derivative correction. We not use the integral correction. Then according to that we make the pwm values. In that case me make the line following path.then to get the turns we use encorders.we use the left hand rule to slove the line following maze. In left hand rule the robot always turn to left side snd make turns.and if path have a t junction robot also use a left hand rule to slove it.If line following area have a curve line robot also done it from pid calculation.and also if the path have a y junction we make our sensor panel to easily recognized it.becourse the 30 mm linedetect from 2 sensors of array.then we can make it easy.

And the node detection section our sensor panel also lead the that section.from that we can recognized the node easily.also we use a LCD display to display it.we also decide to show by a buzzer and some leds.for the moving on the nodes also we use encoder to get the direction.

After thal the wall following unit me make new IR sensor to find the wall. After it will find wall we tern on our ultra sonic sensors and start the calibration the distance towards robot and wall. After that we also calculate the error value of the distance between the robot and the wall.and make pid control system for make robot right way.from pid equalution the robot follow the wall as much as it can. And also we only use propotional controller.

Then robot have to get distance between next two nodes.we it we use encoders of motors.in that section we turn on the encoders and get the derection between two nodes.pololu motors encoder is a very high quality encoder. From it we can get the correct values.

Then the robot will stop at the finish section. Those are the working principle of robot and sorry for the spelling mistake

https://drive.google.com/open?id=1KrOXnekLmdr6wS10XJUMiDLw02XVtviZ https://drive.google.com/open?id=1LsgBcMmyzdmlnG-ancOgziOB8utWmYsn

# References

(Video links, Github link etc) https://drive.google.com/open?id=1EiesrlQWAG6AkqXL3B5oxgR0nha-1wRH

# Any Information you would like to share

We are students of sri chandananda buddhust college, Kandy, Sri Lanka. We still school students.We like have experience of a international event and get knowlaghe about robotics.we hope your panel will accept our registration. Thank you!