MAKE Opensource Award 2019

by Sarawak Red Team

Introduction

We are Sarawak Red Team and we came from Sarawak,

Malaysia.



Felix Thian Zhi Xiang Leader

Declan Hadrian Anak Sem Member

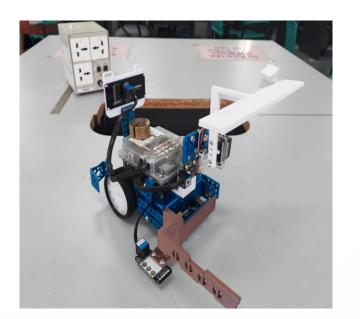


The Mbot

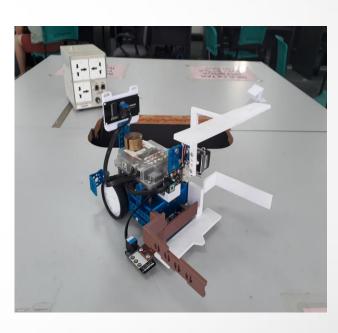
Before







Manual Tasks





Automatic Tasks

 For automatic tasks, We found some new useful methods to overcome the problem.

- Our new methods are:
 - accurate turning (精准90度)
 - -accurate running (精准前进距离)
 - sine wave line following (正弦波精准轨道追踪法)

Accurate Turning

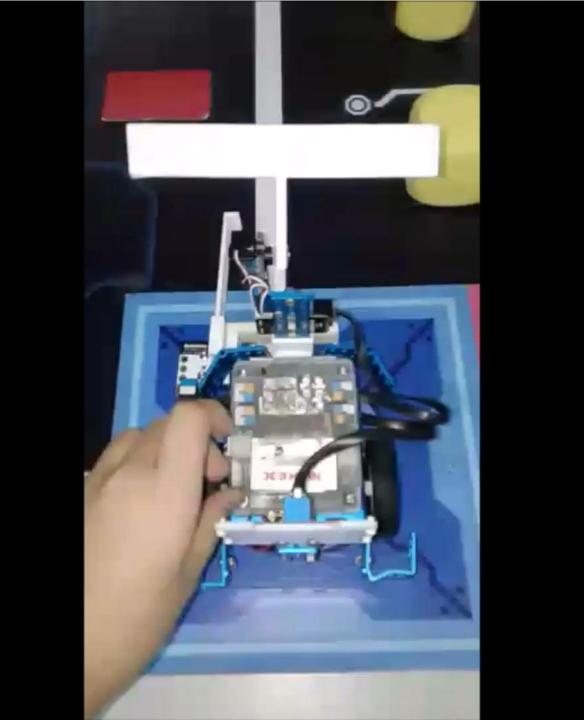
 Turning 90° on the junction and record the time taken, and by calculating the ratio of the angle that need to turn to 90°. After that, the robot can turn very accurate in solving the task.

```
define accurate turn
set turning time to 0
reset timer
turn left at speed 100
wait (0,5 secs
wait_until RGB line follower 1 sensor status is (RGB1~RGB4 '1001'
set turning time to timer
run forward at speed 0
     define turn right to r
     turn right at speed 100
     wait 7 / 90 * turning time secs
     run forward * at speed 0*
       define turn_left to | 1
       turn left at speed 100
       wait 🚺 / 90 * turningtime) secs
                                                              define acc
       run forward at speed 0
                                                              reset time
```

Accurate Running

 Running 20cm on the straight line and record the time taken and by calculating the ratio of the distance with 20cm. After that the robot can run very accurate for any distance needed.

```
define run backward number1
  run backward at speed 180
        number1 / 20 * run_dist secs
                                             define run_forward_number1
  run forward Tat speed 0
                                             run forward at speed 180
                                                   number1 / 20 * run_dist secs
define accurate_run
                                             run forward at speed 0
reset timer
run forward Tat speed 180
wait 0.2 secs
             RGBline follower 17 sensor status is (RGB1~RGB4, 1000) or RGB line follower
 run forward at speed 180
run forward Tat speed 0
set run dist to timer
```



Sine Wave Line Following

- Swing on the track and record the number that it swing. Once it is out of the track, the mbot will calculate the number that it swings and find the correct side to go back to the track.

```
define advance_line_following
     RGB line follower 1 sensor RGBZ detected backgroundcolor and RGB line follower 1 sensor RGB3 detected backgroundcolor
          - 1 mod 2 = 0 then
                                                                                                                            y: 20
   set motor MI speed 0
   set motor MZ speed 255
        not RGB line follower 17 sensor RGB3 detected backgroundcolor and RGB line follower 17 sensor RGB2 detected backgroundcolor
    change x by 1
   set motor M1 speed 255
   set motor MZ speed 0
        not: RGB line follower 17 sensor RGB27 detected backgroundcolor and RGB line follower 17 sensor RGB37 detected backgroundcolor
     change x by 1
       x mod 2 = 0 ther
   set motor M1 speed 200
   set motor M2 speed 180
        not RGB line follower 🕩 sensor RGB2 detected backgroundcolor and RGB line follower 📭 sensor RGB3 detected backgroundcolor
    change x * by 1
   set motor M1 speed 180
   set motor MZ speed 200
        not RGB line follower 😰 sensor RGB3 detected backgroundcolor and RGB line follower 📭 sensor RGB2 detected backgroundcolor
     change x by 1
```



Sharing sessions:

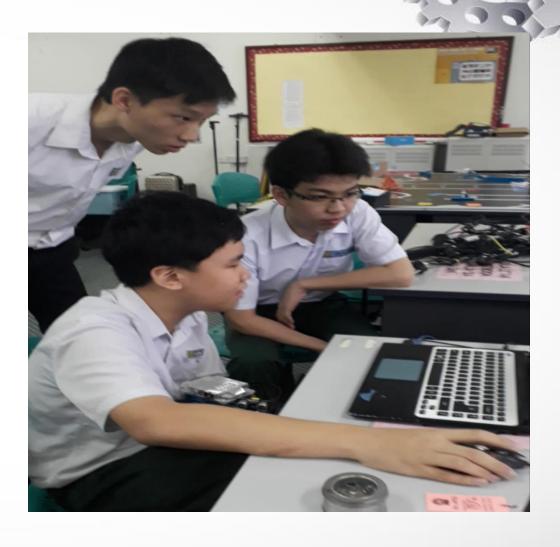
Introducing and demonstrating MakeX in school.



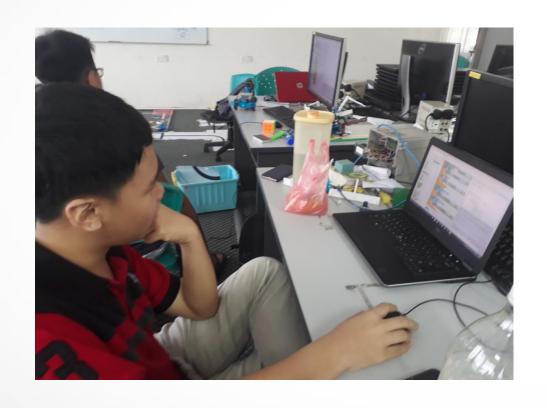


Discussion and explanation about our new methods





Improve our mbot and programming to get accurate result.







Competition	Achievement
MakeX Robotics Competition (Zone Sarawak)	MakeX Starter: City-Guardian 1st runner up
MakeX Robotics Competition (Malaysia)	MakeX Starter: City-Guardian 1st runner up Appearance Design Award





Competition	Achievement
Borneo	Maze Solver(Open Category): Champion (Cash RM 3,000.00)
International	Maze Solver(School Category): 4th place (Certificate)
Drobotex	Auto line follower(School): 4th place (Group 1) (Certificate)
Competition	Drone Delivery(School): Champion (Group 1 – Cash RM
2019	2,000.00) + 2 nd runner up (Group 2 – Cash RM 800.00)
	Drone obstacle(School): 1 st runner up (Group 1 – Cash RM 1,200.00)

Competition Achievement

IEEE **Robotics** Challenge Competition (Mini)

Champion for Challenges 1, 2 & 3 and overall Champion (Gold Award)









Competition

Achievement

IEEE Sarawak Robotics Competition 2019 – RoboRace Challenge (Junior Group)

Group 1: Champion

Group 2: 1st runner up





Competition

Achievement

IEEE Sarawak Robotics
Competition 2019 –
PathFinder Challenge
(Senior Group) – as
mentor

Group 1: 1st runner up

Group 2: 2nd runner up





Suggestion to MakeBlock

- Add battery indicator in Makeblock 3 and 5
- Add higher rpm motor



THANK YOU

Sarawak Red Team

