# Magnetic Motion Robot (MMR): How MMR follows a black line

```
Arduino Program
initializeMMR
set stepright to 0
set stepleft to 0
forever

if is black detected then
move() steps 250 millisecsangle(20
set stepright to 0
set stepright to 0
set stepright to 0
set stepright to stepright + 1
else
if stepright | 5 then
repeatuntil | 5 black detected or stepright = 0
turnLeft() steps 250 millisecsangle(20
set stepright to stepright - 1

if stepleft < 5 then
turnLeft() steps 250 millisecsangle(20
set stepleft) to stepleft + 1
else
if stepleft | 5 then
turnLeft() steps 250 millisecsangle(20
set stepleft) to stepleft + 1
else
if stepleft | 5 then
repeatuntil | is black detected or stepleft = 0
turnRight() steps 250 millisecsangle(20
set stepleft) to stepleft + 1
else
if stepleft | 5 then
repeatuntil | is black detected or stepleft = 0
turnRight() steps 250 millisecsangle(20
set stepleft) to stepleft - 1
```

```
42 void loop() {
43
44
      if (digitalRead (PINLINEF) == 1) {
45
          mmrMove(1,250,30,servo 1,servo 2);
46
           stepright = 0;
47
          stepleft = 0;
48
      lelse(
49
           if((stepright) < (6)){
               mmrTurnRight(1,250,20,servo 1);
51
               stepright = (stepright) + (1);
52
53
               if(((stepright) == (6))){
54
                   while(!((digitalRead(PINLINEF)==1) || (((stepright)==(0)))))
55
                       mmrTurnLeft(6,250,20,servo 2);
57
58
                       stepright = (stepright) - (1);
60
61
               if((stepleft) < (6)){
                   mmrTurnLeft(1,250,20,servo 2);
63
                   stepleft = (stepleft) + (1);
64
                   if(((stepleft) == (6))) {
66
                       while(!((digitalRead(PINLINEF)==1) || (((stepleft)==(0)))))
67
68
69
                           mmrTurnRight(6,250,20,servo 1);
```

## **Teachers**

The code "DemoLineFollower.sb2" is an example how the MMR follows a black line.

The code is very simple as you can see in the block section in the image:

- Initialize the Magnetic Motion Robot (MMR).
- In the main loop, the MMR is continuously testing is a black line is detected by the sensor.
- If the black line is detected, MMR moves one step forward (angle = 20°; velocity=250 millisecs)
- If the black line is not detected, MMR moves several steps to the left and to the right to find again the black line.

## **Kids**

### **ACTIVITY 1**

Code the MMR to increase the motion velocity.

### **ACTIVITY 2**

Code the MMR to improve the line follower algorithm.