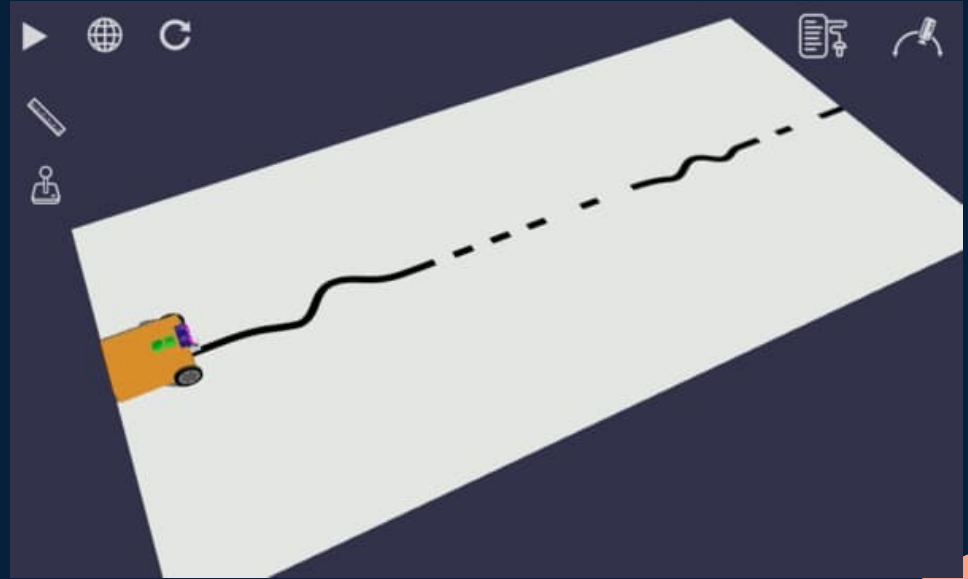


Double Sensor Line Follower

A POSTERIORI

Play · Experience · Learn

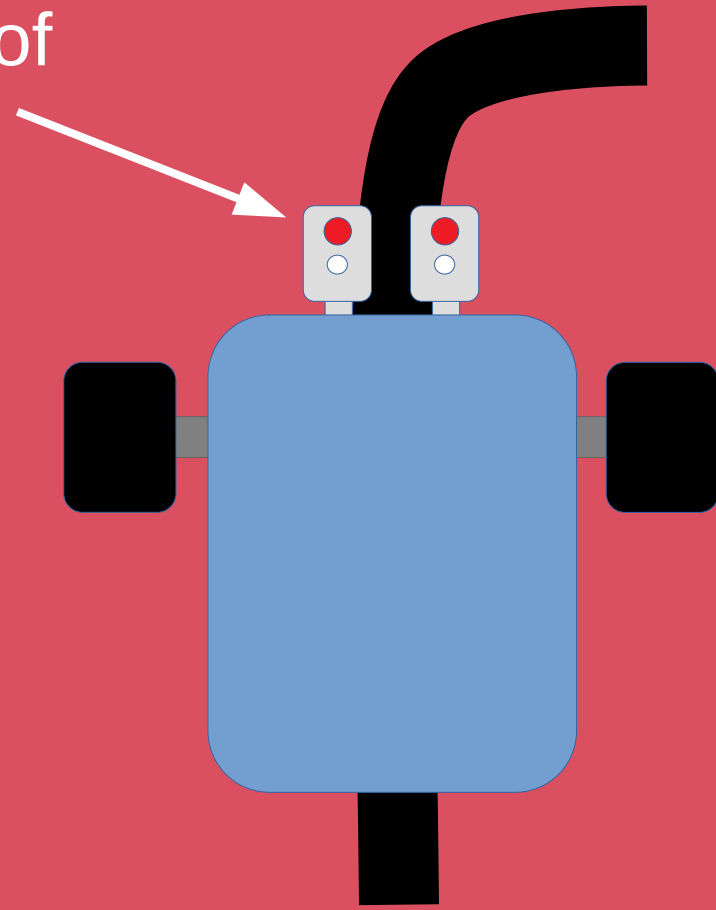


Before We Start

- Robot
 - Use the “Double Sensor Line Follower” robot
- World
 - Use “Line Following Challenges” world
 - Start with the “Simple Curves” challenge

Double Sensor Line Following

- One sensor on each side of line
- Why two sensors?
 - Detect intersection
 - Cross gaps



Simple Approach

Left Sensor	Right Sensor	Action
Black	White	Turn Left
White	Black	Turn Right
White	White	Go Straight
Black	Black	Depends (Intersection)

- Problems

- Not smooth
- Cannot apply any of the techniques that we've learned in the single sensor line follower

Difference Method

- Calculate difference between left and right sensor

Pseudo Code

```
difference = sensorLeft - sensorRight
```

- Instead of using the sensor value directly, we'll use the difference between the two sensors.
- Rest of the code is mostly the same as the single sensor line follower!

2 States Algorithm

```
When Started
repeat while true
do
  if color_sensor reflected light intensity on port Auto > 50
  do
    move steering with direction -50 and speed 20 %
  else
    move steering with direction 50 and speed 20 %
```

← Single Sensor

Double Sensor
↓

```
When Started
repeat while true
do
  set difference to color_sensor reflected light intensity on port 1 - color_sensor reflected light intensity on port 2
  if difference < 0
  do
    move steering with direction -50 and speed 20 %
  else
    move steering with direction 50 and speed 20 %
```

What are the differences?

Challenges

- Try implementing a proportional control for a double sensor line follower
- Try completing these challenges:
 - Simple Curves
 - Sharp Turns
 - Gaps 1
- Note: You won't be able to complete "Gaps 2" with line following alone. This is meant to be a special challenge.

Areas to Explore 1

- The difference method works by converting 2 sensors value into a single difference value. We can then use that single value with our usual single sensor line follower algorithm.
- What if we have more than 2 sensors? (eg. 4 sensors) Can you find a way to convert 4 (...or more) sensor readings into a single value?



Areas to Explore 2

- Here we are using reflected light values from two sensors. Can you apply the same method to other types of sensors?
- Program your robot to read from two ultrasonic sensors and center itself between two walls as it moves (...you'll need to create your own custom world and robot to test this)



A POSTERIORI

Play · Experience · Learn

- Created by A Posteriori LLP
- Visit <http://aposteriori.com.sg/> for more tips and tutorials
- This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.