# Line Following Robot

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# Project objective


For this project the a line following robot must be capable of:

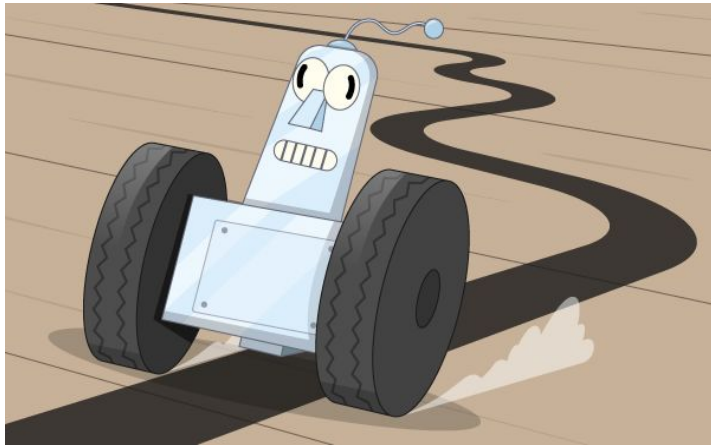
- Line following
- Turns
- Error correction
- Environmentally insensitive

# Overview

An autonomous robot can be configured to follow a path. This robot takes analog inputs and converts it to digital for processing.

Major components:

- Sensors
- Motor
- Programming



# Sensor Setup

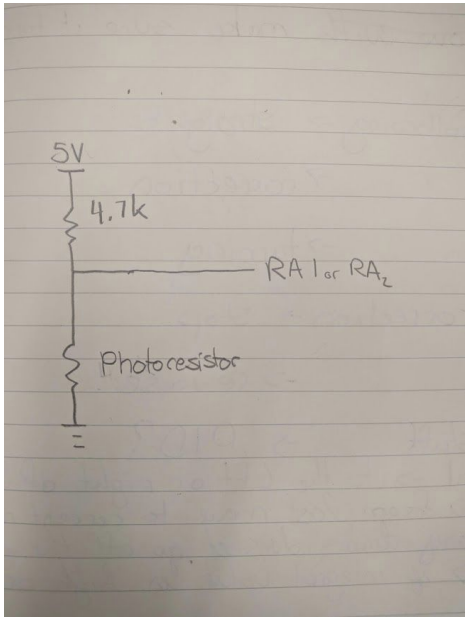
2 Photoresistors and a bright white LED 1cm from ground

Voltage divider with 4.7KOhm and photoresistor as input to PIC

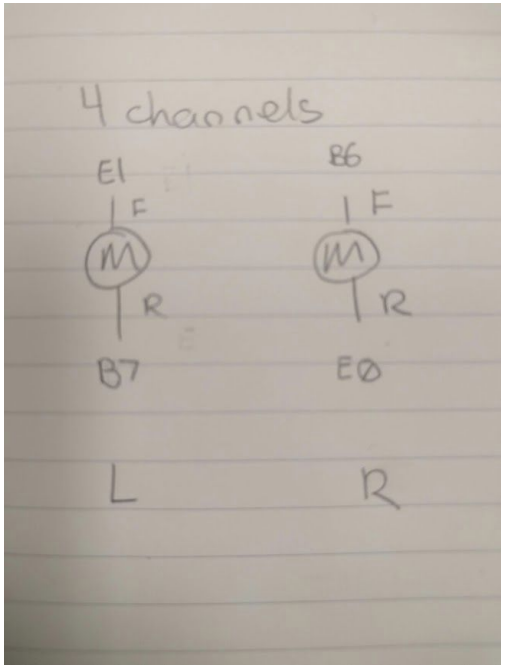
On the line, RA1/2 < 255 (around 100)

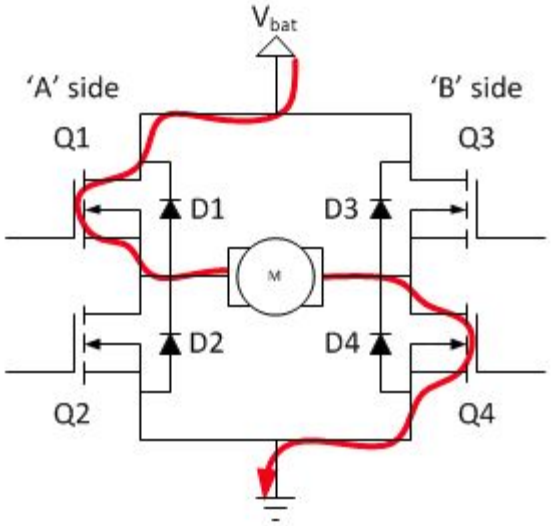
Off the line  RA1/2 > 255 (around 400)

Keep only WH



# Motor Setup



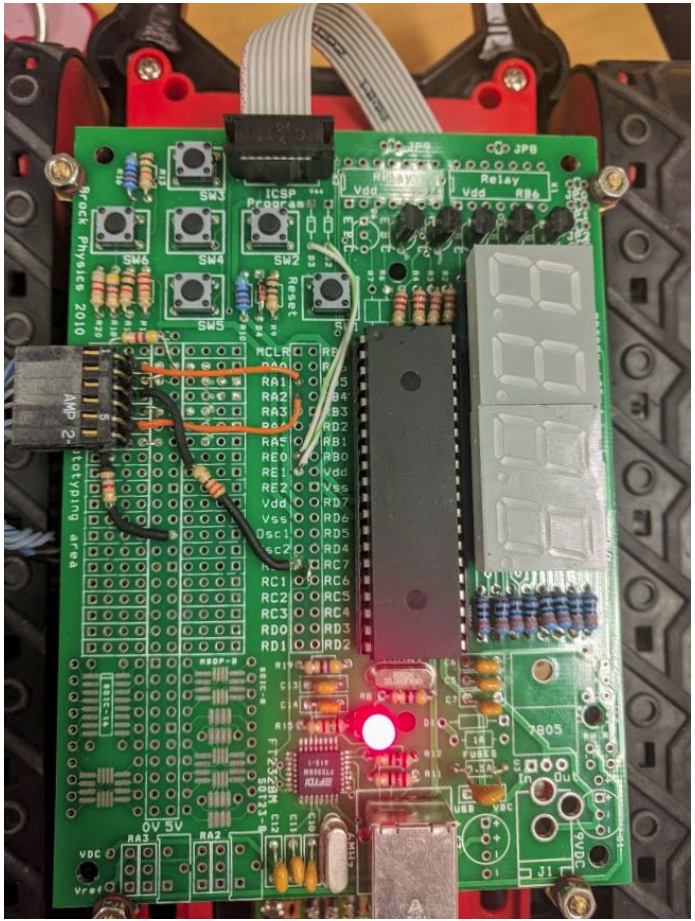

Hbridge is used on a seperate board to control the motor.

# Pic interface

Sensor inputs to RA1, RA2 - ADC converter pins

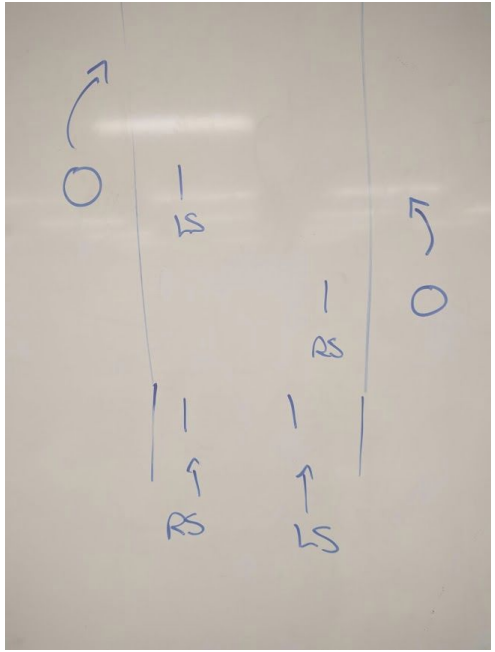
PORTE 0,1 and PORTB 6,7 output to motor via ribbon cable

Program on PIC microcontroller



# Operation

- When a sensor detects a white space, turn in the opposite direction
  - Turn in place by moving one side forward and the other side reverse
- If on the line, go forward
  - The longer you move forward, the faster you go
- If off the line, reverse.
  - Reverse only in one direction at a time



# Next steps

Real PID control: PID stands for Proportional Integral Differential control. It would make the movement much smoother.

Real PWM : Pulse width modulation is essential for a PID control algorithm

Additional sensors for obstacle avoidance

If the forward pins are connected to PWM pins and the code was written in C it would be much easier to implement.

# Fin

Questions?