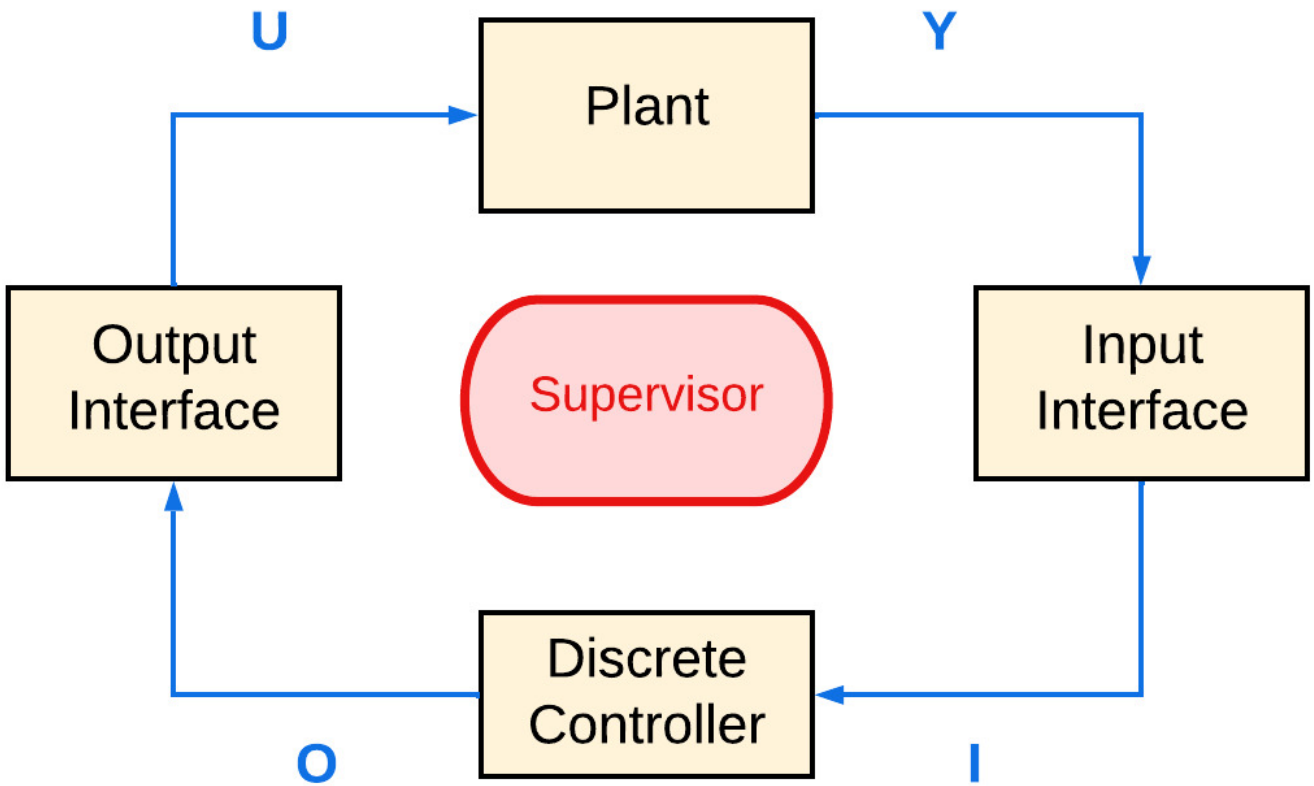
Line Follower Robot

Embedded Real-Time Systems (ERTS) Lab
Indian Institute of Technology, Bombay

Model of Cyber-Physical System



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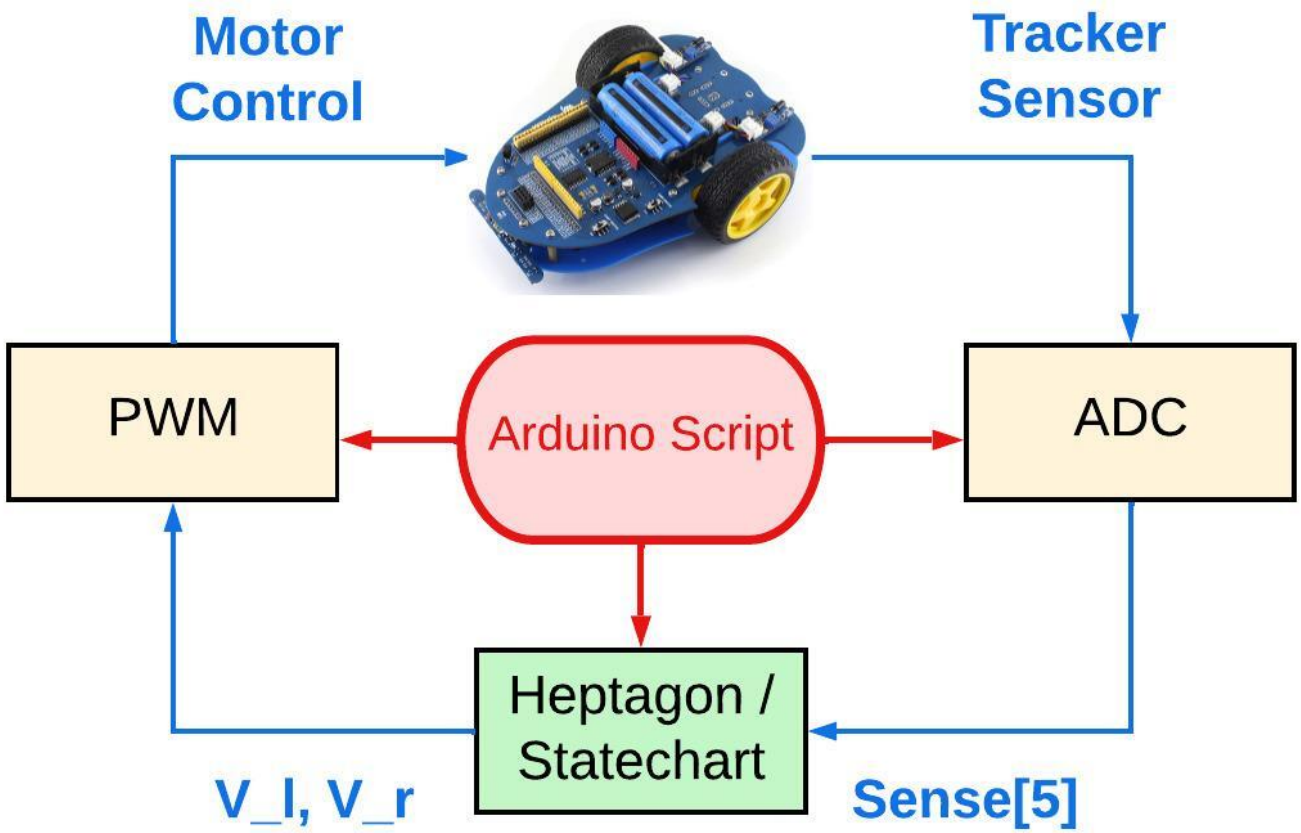

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Arduino Script

```
int sensorValues[NUM_SENSORS];
Linefollower__main_mem mem;
Linefollower__main_out _res;

void setup()
{
  Linefollower__main_reset(&mem);
  motion_init();
  forward();
  sensor_init();
  Serial.begin(115200);
}

void loop()
{
  AnalogRead(sensorValues);
  Linefollower__main_step(sensorValues[0], sensorValues[1], sensorValues[2],
                          sensorValues[3], sensorValues[4], &_res, &mem);
  SetSpeed(_/res.v_l, _res.v_r);
}
```

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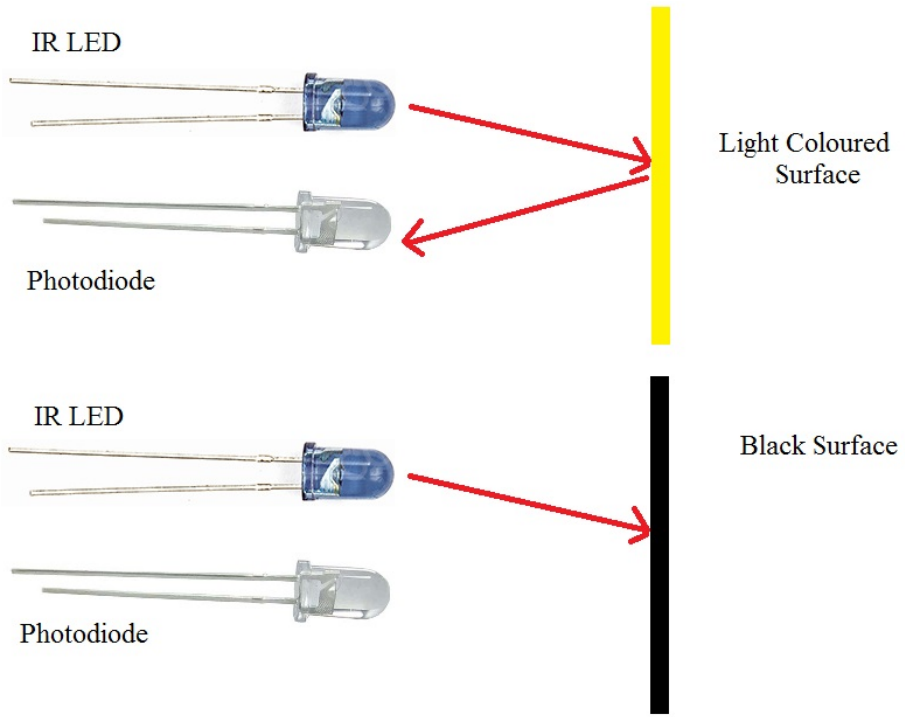

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- Corner cases:
  power_difference > maximum then v_l = 0 and v_r = maximum
  power_difference < (-maximum) then v_l = maximum and v_r = 0

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3. We may get:
   1. Actual Min – higher than 0
   2. Actual Max – lower than 1023

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4. Normalization process – linear transformation from [Min Max] to the range of [0 1000]

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5. Calibrated value = (Value - Min) * 1000 / (Max - Min)
6. For Line switching: Calibrated value = 1000 - Calibrated value

Thank You!