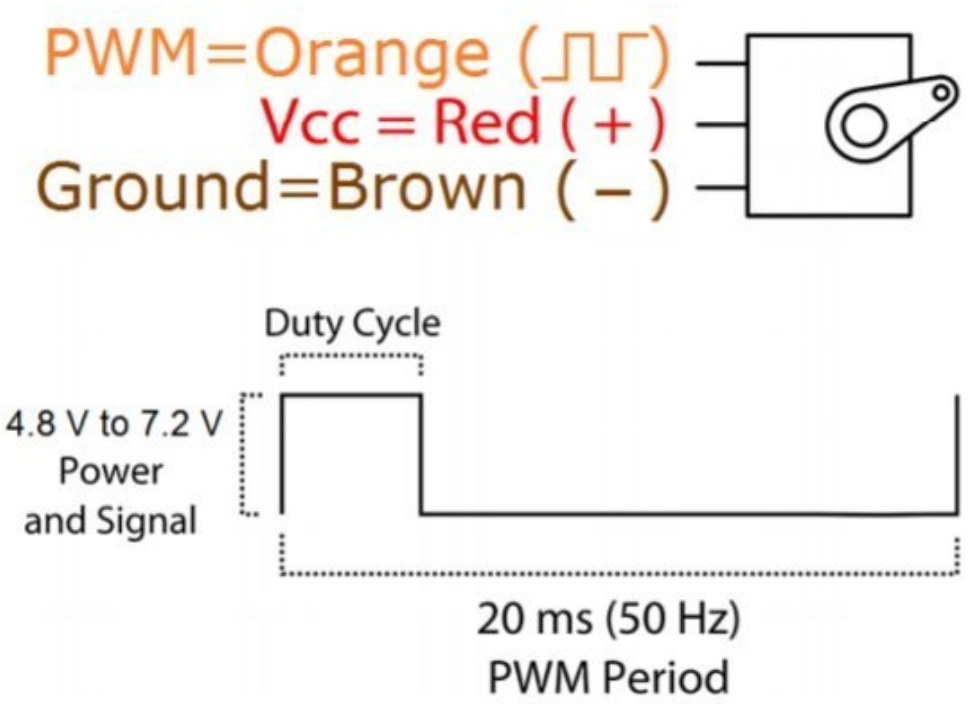
Microcontrollers & Applications

Lecture 6.3: Servo (RC) Motors

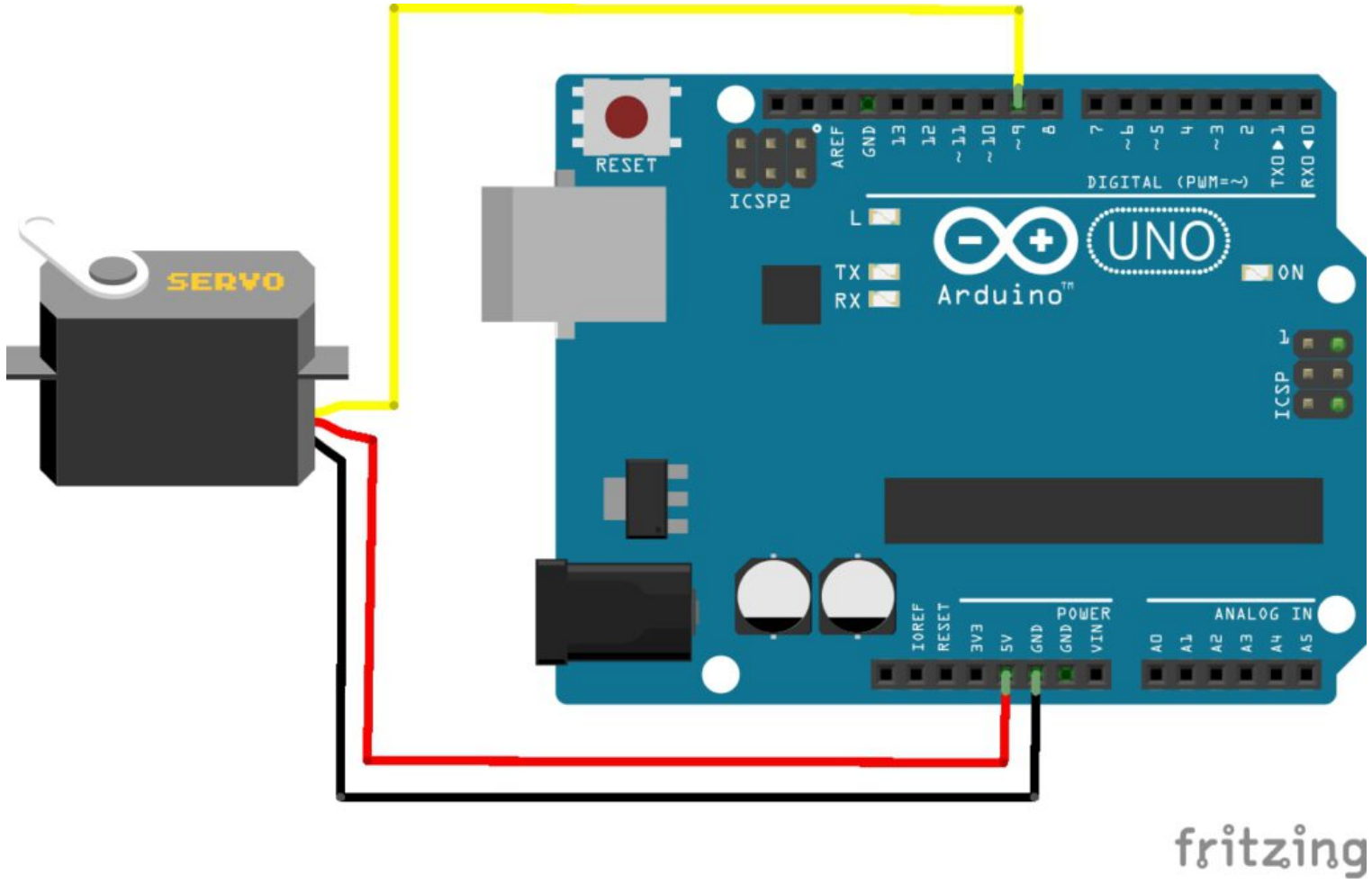
Servo Motor: Structure

Servo Motor: Control

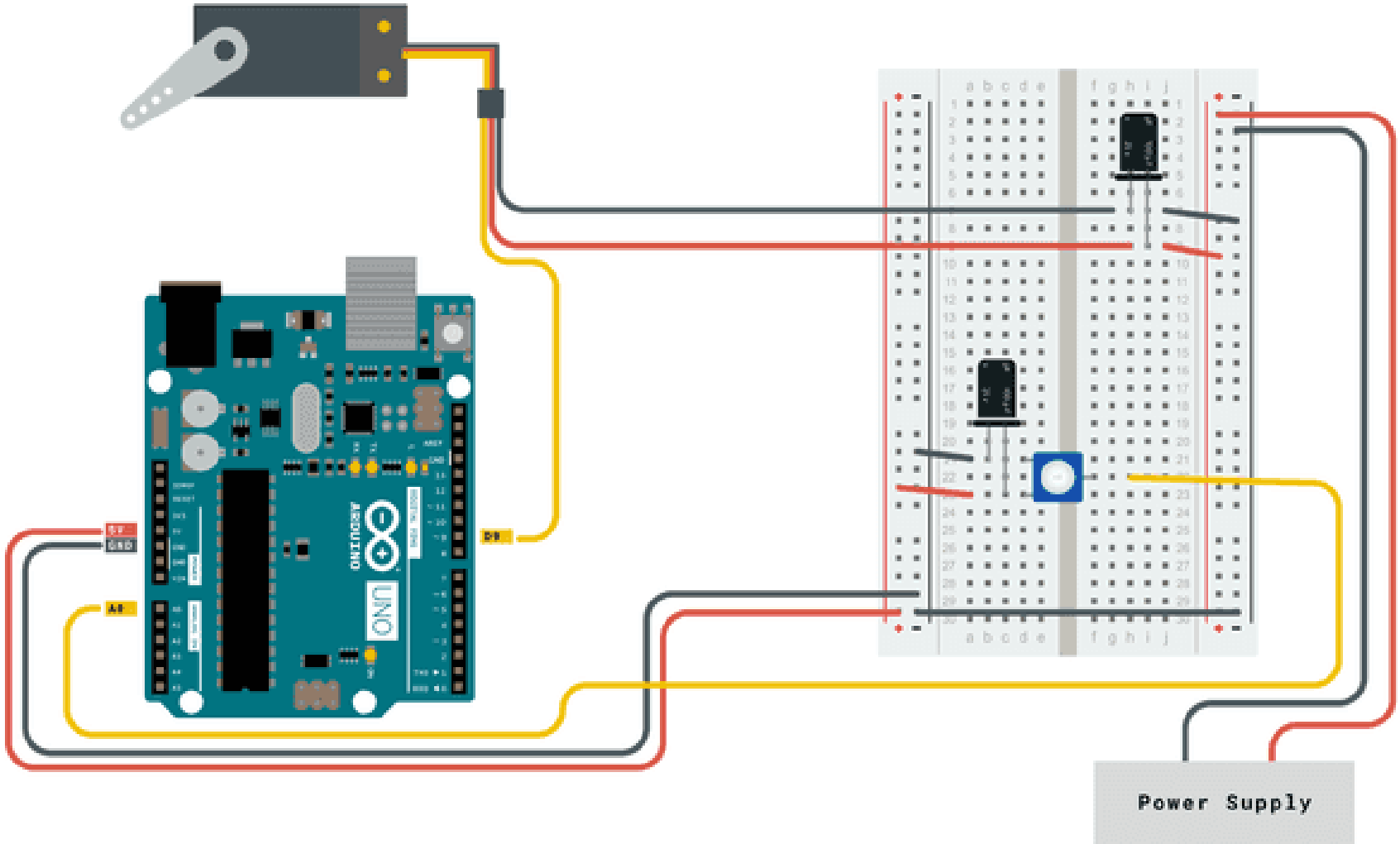
- Power supply: 4.8V - 6V
- No-load speed (4.8V): 0.18sec/60°
- No-load speed (6.0V): 0.16sec/60°
- Stall tork (4.8V/6.0V): 4.8kg / 6.0kg
- Stall current(4.8V/6.0V): 0.9A / 1.1A
- Idle current: 6mA
- Nominal torku (4.8V/6.0V): 6kg / 7.1kg
- PWM-controlled Position (Angle from 0 to 180)
- Gear can be plastic or metallic
- It requires a driver module in most cases
- It requires a specific PWM period



Servo Motor Control: Arduino Example (1)



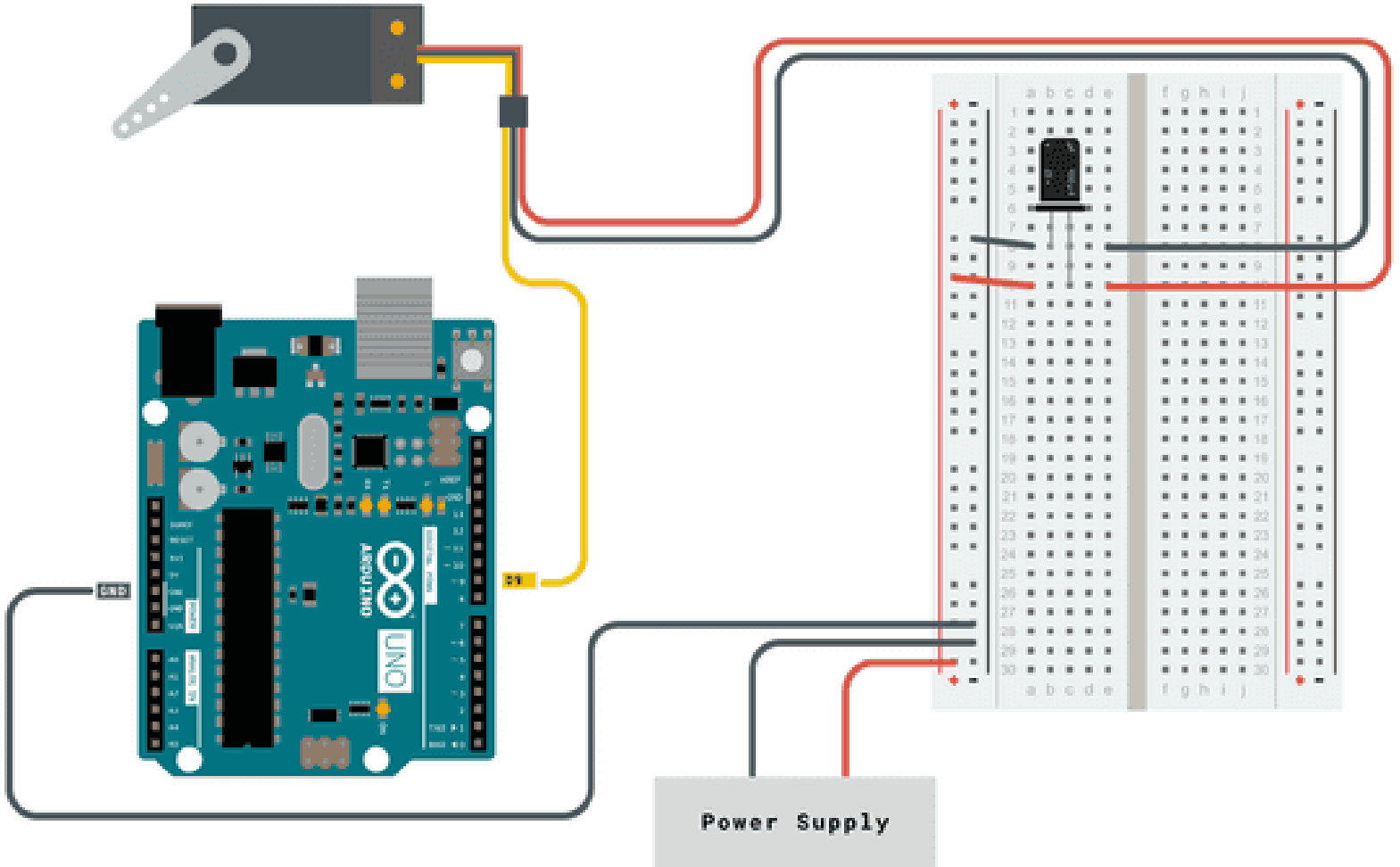
Servo Motor Control: Arduino Example (2)



Servo Motor Control: Arduino Example (3)

```
/*
  Servo motor changes its position by depending on the potentiometer value from 0 º (the left-most position) to 180 º (the right-most position)
*/
#include <Servo.h>

Servo myservo;

#define POT  A0
int val;

void setup() {
  myservo.attach(9);  // attaches the servo on pin 9
  // This pin must be PWM (~) capable
}

void loop() {
  val = analogRead(POT);
  val = map(val, 0, 1023, 0, 180);
  myservo.write(val);
  delay(15);        // waits for the servo to get there
}
```

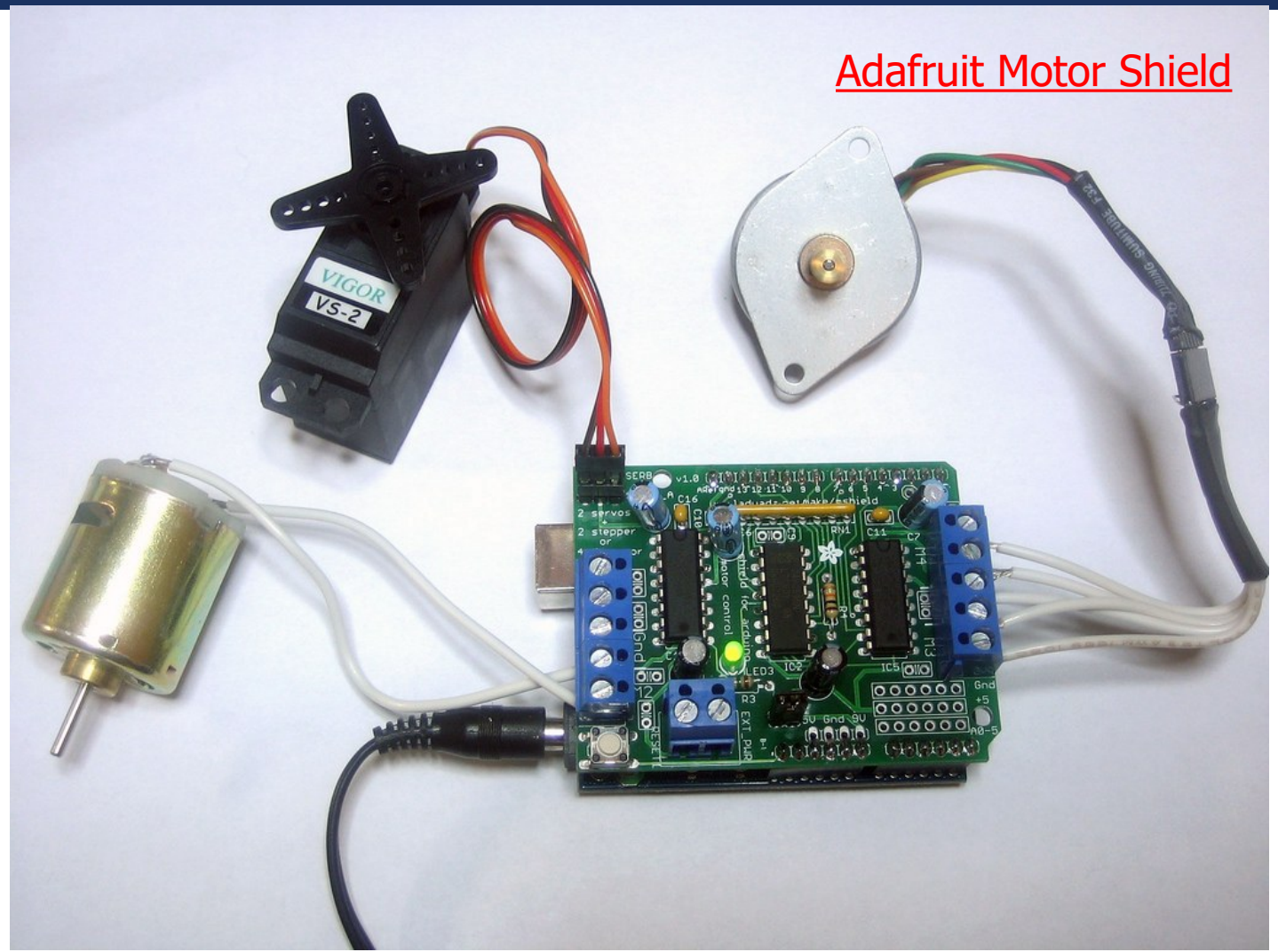
Servo Motor Control: Arduino Example (4)



Servo Motor Control: Arduino Example (5)

```
/*
  Servo motor sweeps from 0 º (the left-most position) to 180 º (the right-most position)
*/
#include <Servo.h>

Servo myservo;
int pos = 0;    // variable to store the servo position

void setup() {
  myservo.attach(9);  // attaches the servo on pin 9
}

void loop() {
  for (pos = 0; pos <= 180; pos++) {
    myservo.write(pos)
    delay(15);    // waits 15ms to reach the position
  }
  for (pos = 180; pos >= 0; pos--) {
    myservo.write(pos);
    delay(15);          // waits 15ms to reach the position
  }
}
```

Servo Motor Control: Arduino Example (6)



Servo Motor Control: Arduino Example (7)

```
#include "AFMotor.h"
#include "Servo.h"

Servo  myservo;

int pos = 0;    // variable to store the servo position

void setup() {
   myservo.attach(9); // for SER0
                  // .attach(10) for SER1
   }

void loop() {
  for (pos = 0; pos <= 180; pos++) {
    myservo.write(pos)
    delay(15);    // waits 15ms to reach the position
  }
  for (pos = 180; pos >= 0; pos--) {
    myservo.write(pos);
    delay(15);          // waits 15ms to reach the position
  }
}
```

Left to Students

- Design a Automotive Speed Indicator
  - You should use a potentiometer to change the car speed,
  - You should use a servo motor to indicate it by changing the position,
  - You may use the serial port,
  - You may add an LCD screen,
  - etc.

Thanks for listening ☺

YALÇIN İŞLER

Assoc. Prof.