**Code for the Arduino**

// fsr

int fsrPin1 = 1; // the FSR and 10K pulldown are connected to a0

int fsrPin2 = 2;

int fsrPin3 = 3;

int fsrReading =0 ; // the analog reading from the FSR resistor divider

int fsrVoltage =0; // the analog reading converted to voltage

unsigned long fsrResistance=0; // The voltage converted to resistance, can be very big so make "long"

unsigned long fsrConductance=0;

long fsrForce =0; // Finally, the resistance converted to force

// speed

volatile byte revolutions=0;

unsigned int rpm=0;

float v;

unsigned long timeold=0;

unsigned long interval=0;

void setup(void)

{

Serial.begin(9600); // We'll send debugging information via the Serial monitor

attachInterrupt(0, magnet\_detect, RISING);//Initialize the intterrupt pin (Arduino digital pin 2)

}

void loop(void)

{

Serial.print("#");

for(int i=fsrPin1; i<=fsrPin3; i++)

{

fsrReading = analogRead(i);

//Serial.print("FSR ");

//Serial.print(i);

//Serial.print('\n');

//Serial.print("Analog reading = ");

//Serial.println(fsrReading);

// analog voltage reading ranges from about 0 to 1023 which maps to 0V to 5V (= 5000mV)

fsrVoltage = map(fsrReading, 0, 1023, 0, 5000);

//Serial.print("Voltage reading in mV = ");

//Serial.println(fsrVoltage);

if (fsrVoltage == 0)

{

// Serial.println("No pressure");

}

else

{

// The voltage = Vcc \* R / (R + FSR) where R = 10K and Vcc = 5V

// so FSR = ((Vcc - V) \* R) / V

fsrResistance = 5000 - fsrVoltage; // fsrVoltage is in millivolts so 5V = 5000mV

fsrResistance \*= 10000; // 10K resistor

fsrResistance /= fsrVoltage;

//Serial.print("FSR resistance in ohms = ");

//Serial.println(fsrResistance);

fsrConductance = 1000000; // we measure in micromhos so

fsrConductance /= fsrResistance;

//Serial.print("Conductance in microMhos: ");

//Serial.println(fsrConductance);

// Use the two FSR guide graphs to approximate the force

if (fsrConductance <= 1000)

{

fsrForce = fsrConductance / 80;

//Serial.print("Force in Newtons: ");

//Serial.print("|");

Serial.print(fsrForce);

Serial.println(";");

}

else

{

fsrForce = fsrConductance - 1000;

fsrForce /= 30;

//Serial.print("Force in Newtons: ");

// Serial.print("|");

Serial.print(fsrForce);

Serial.println(";");

}

}

//Serial.println("--------------------");

delay(1000);

}

//speed

//Serial.println("velocity: ");

if (revolutions >= 1)

{

interval = millis() - timeold;

rpm = 60000/interval;

v = (0.6) \* rpm \* 0.1047;

timeold = millis();

revolutions = 0;

//Serial.println(rpm);

//Serial.println(interval);

//Serial.print("|");

Serial.print(v);

Serial.println(";");

}

else

{

v = 0;

// Serial.print("|");

Serial.print(v);

Serial.println(";");

}

//Serial.println("--------------------");

Serial.println("~");

}

void magnet\_detect()//This function is called whenever a magnet/interrupt is detected by the arduino

{

revolutions++;

Serial.print('\n');

}