ME226 Homework 2

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- ## Resistive Potentiometer:

Audio control: Both linear, and rotary potentiometers, are used to control audio equipment for changing the loudness and other audio related signals.

Old Televisions: They are used to control the picture brightness, colour response and contrast.

Motion control: In order to create a closed-loop control, potentiometers are used as position feedback devices known as a servomechanism.

Voltage divider: in the electronic circuit.

- ## Piezoelectric transducers:

Electrical lighters: Force is used to produce electric current to produce a spark.

Seismographs: to measure vibrations in rockets.

Ultrasonic Imaging: in medical applications.

- ## Capacitance based transducers:

To find the humidity level: As the humidity value changes the capacitance value of this transducer also changes. By this value, we can measure the change in humidity.

In determining the quantities like **temperature, displacement, and pressure**

Precision positioning: Capacitive displacement sensors can be used to measure the position of objects down to the nanometric level. This type of precise positioning is used in the semiconductor industry where silicon wafers need to be positioned for exposure.

- ## Magnetoresistive displacement transducers:

Used for accurate **path and angle measurement**.

Contactless switches

Determination of magnetic fields

Original Application:

Fitness wearable watches have become very popular lately. One of it’s primary purpose is to keep a track of the number of steps taken when you go for a walk or a run. A wearable tracker continuously senses the movements of the body on a 3 axis accelerometer. This is not super accurate and sometimes also adds steps due to hand movements.
Alternatively, I thought of adding piezoelectic transducers to the bottom of the shoes to detect the number of steps. This would be extremely accurate. Since the electric charge is proportional to the intensity of load, we can also comment whether the user was running or walking.