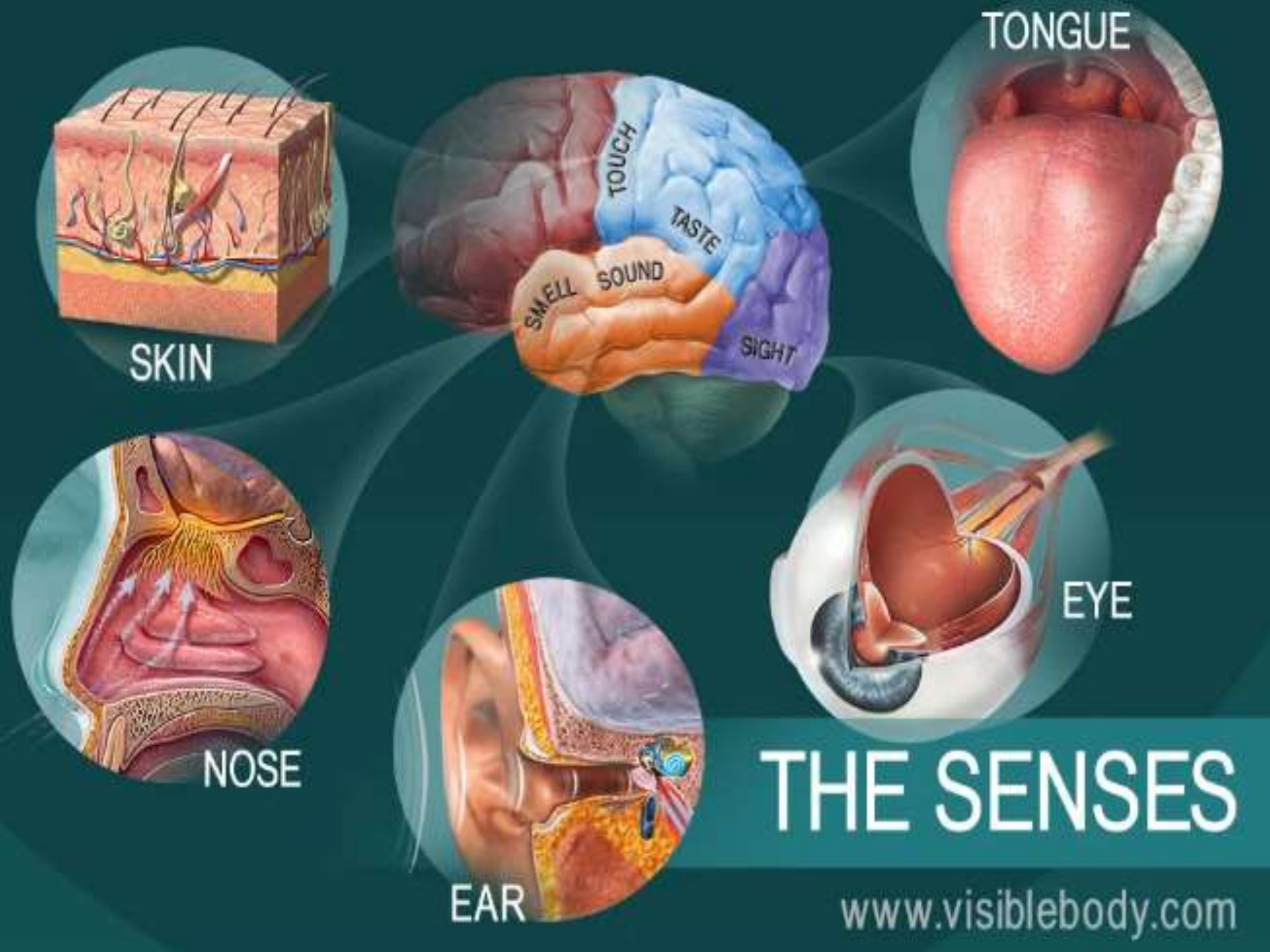
TONGUE
TOUCH
TASTE
SMELL
SOUND
SIGHT
SKIN
NOSE
EAR
EYE
THE SENSES
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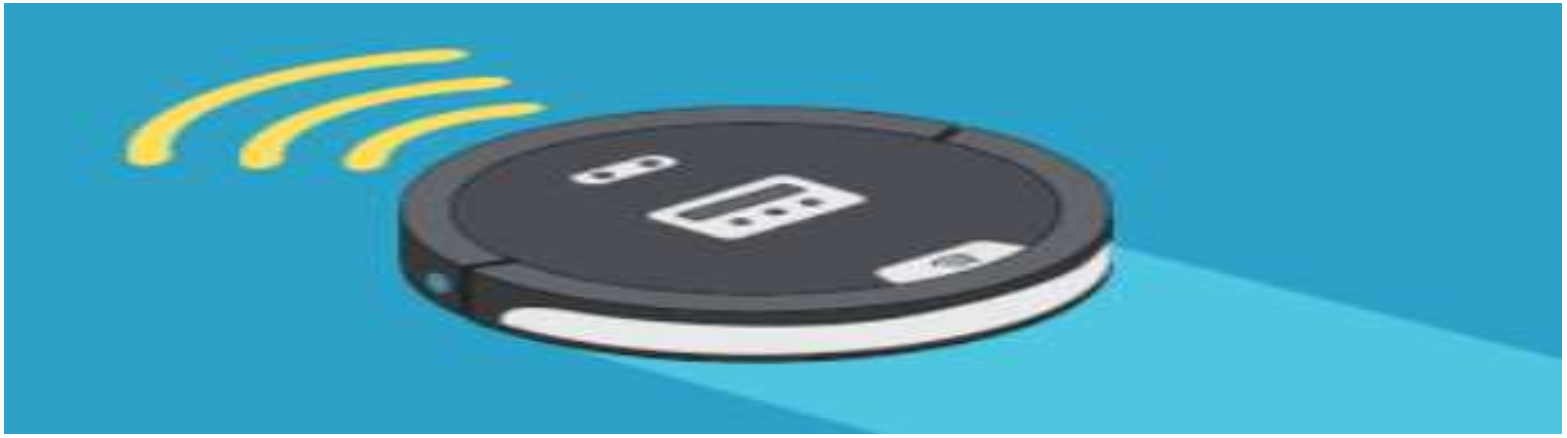
Introduction to Sensors

- **Sensor is an electronic device that measures physical Quantities such as temperature, pressure, distance, speed, torque, acceleration, etc., from devices, appliances, and other systems.**



Characteristics of Sensors :

- **Sensitivity:** Relative Change in output response divided by the change in input response.
  - Example: Weighing Machine used in Jewellery Shop.

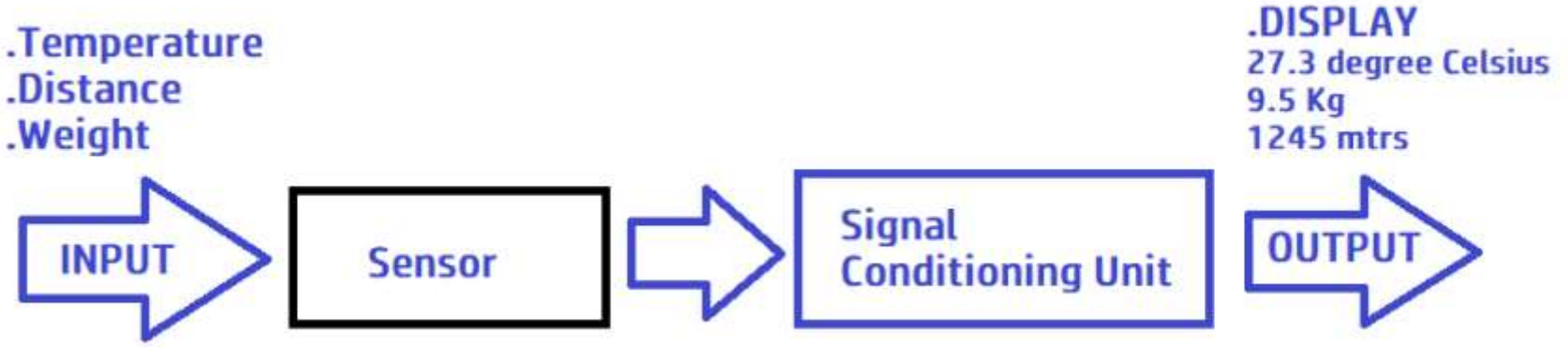
- **Range:** It is the difference between the smallest and the most significant outputs that a sensor can provide.
  - Example: Radio Frequency (RF) Remote-based Central Locking System in Car.

- **Reliability :** It is the ratio between the number of times a system operates properly and the number of times it is tried.
  - Example: InfraRed (IR) Sensor in TV Remote.

- **Accuracy:** It shows how the closer output of the sensor is to the expected value.
  - Example: Mercury Thermometer Versus Digital Thermometer

Working of Sensors:

- It detects and responds to input from the physical environment, like light, heat, motion, moisture, and pressure; the output is generally a signal converted to a human-readable format.
- In specific Applications, An analog sensor alone may not be sufficient to analyze / process the obtained signal. In those cases, a signal conditioning unit is used to maintain the sensor's output voltage levels in the desired range concerning the end device we



Types of Sensors :

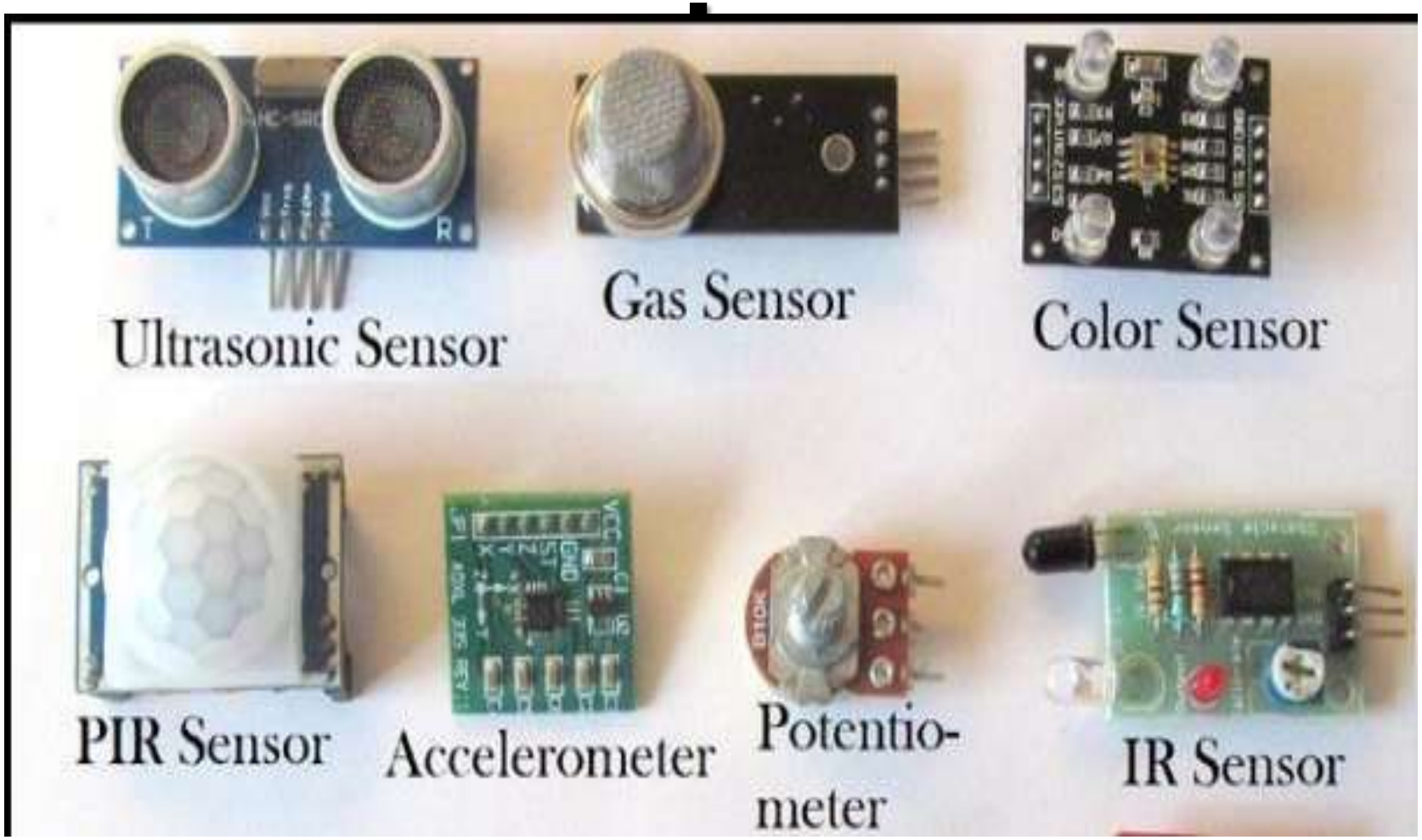
- **Analog Sensor :** Analog sensors convert the Physical Quantity input into Output Analog Signals, which vary continuously. Thermocouples used in gas water heaters offer an excellent example of analogue sensors.

- **Digital Sensor :** Digital sensors produce a discrete signal that is a digital representation of a measurement. This sensor will display binary output in ones and zeros. (1's – ON & 0's – OFF)

Need for Sensors :

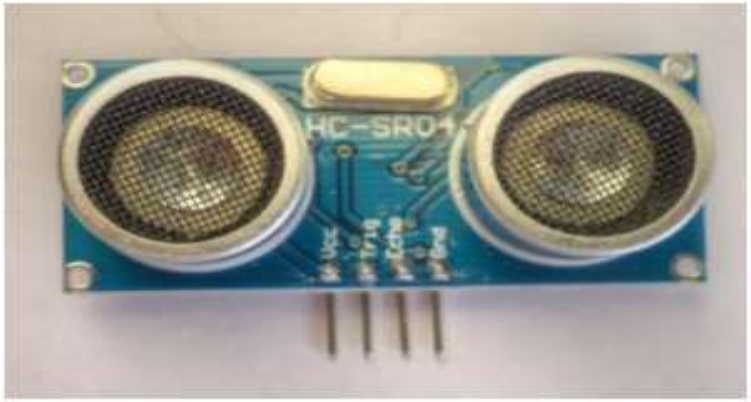
- To develop Low-Cost Automation Projects like an Automatic Corridor Light control system, Automatic Hand wash/Sanitizer Dispenser, and Drinking Water Tank Control System.
- To Implement Safety and Process Control in Appliances like Door Control in Microwave ovens, Temperature control of AC / Refrigerator.

Applications of Sensors :



Light-Distance :

- IR Sensor (IR Transmitter / IR LED)
- Photodiode (IR Receiver)
- Light Dependent Resistor
- Ultrasonic sensor



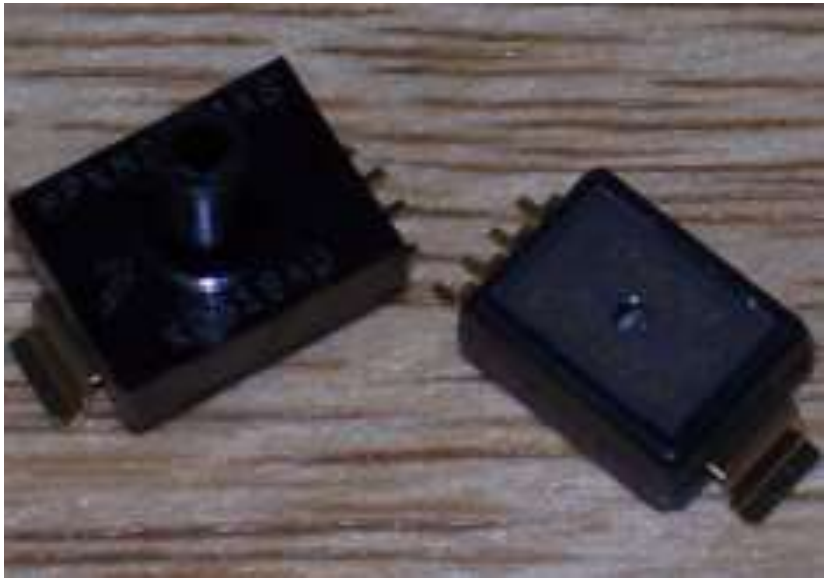
IR SENSOR (TRANSCEIVER)

Temperature :

- Thermistor
- Thermocouple

Pressure/Force/Weight :

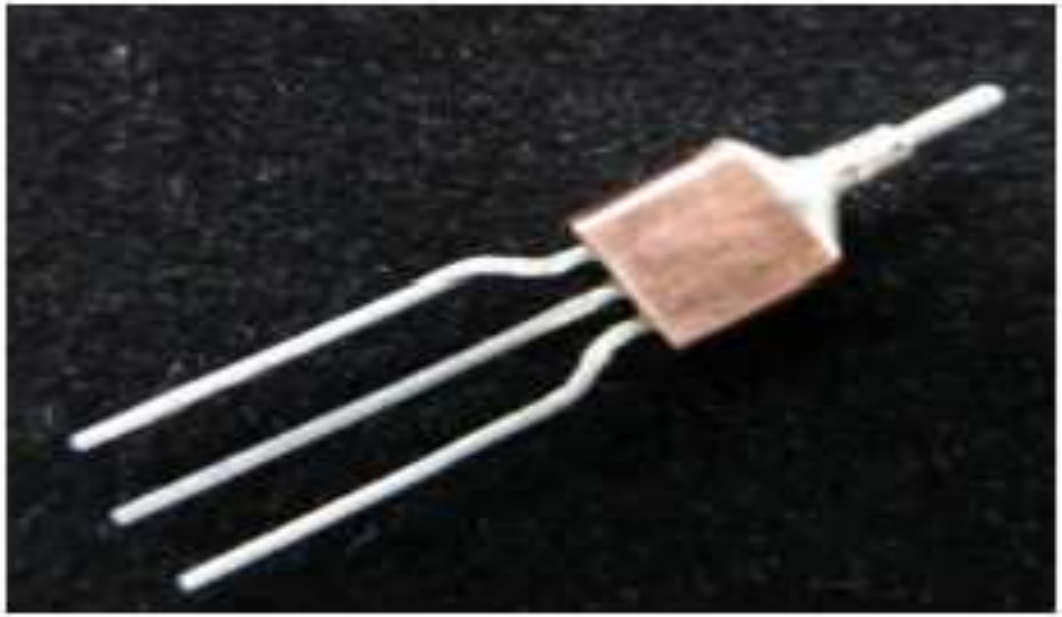
- Strain Gauge (Pressure Sensor)
- Load Cells (Weight Sensor)



Position :

- Potentiometer
- Encoder

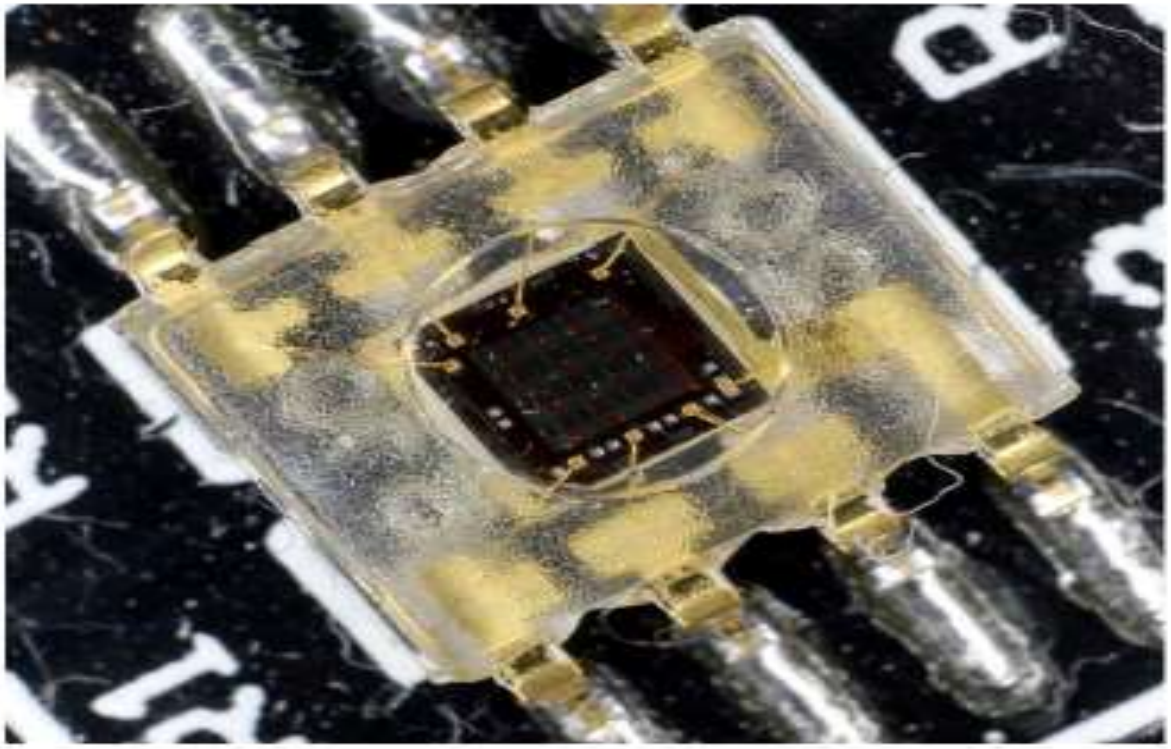
Hall Sensor (Detect Magnetic Field)



Touch Sensor-Smart Phone Screen

Accelerometer / Tilt Sensor- Smart Phone Games

Color Sensor




THANK YOU