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Assignment

1.) Biomedical sensors are the product of the integration of electronic information technology and biomedicine, and they trace a strong vitality with the development of multidisciplinary ~~inter~~ interactions. Biomedical sensors are special electronic devices that can transduce biomedical signals into easily measurable electric signals. Biomedical sensors are the key component in various medical diagnostic instruments and equipment. Biomedical sensors are usually classified according to the quantity to be measured and are typically categorised as physical, electrical or chemical depending on their specific applications.

- Hydrogel based sensors
- fiber optic sensors
- Electrochemical sensors

Actuators

Actuators are mechanical or electromechanical devices that provide controlled and sometimes limited movement in positioning which are operated electrically, manually or by various fluids such as air hydraulic, two basic motions are linear actuators into straight line motion, typically for positioning applications, and usually have a push and pull function. Some linear actuators are upward and manually operated by use of a

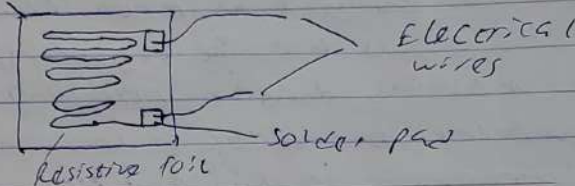
rotating knob or hand wheel:

Application

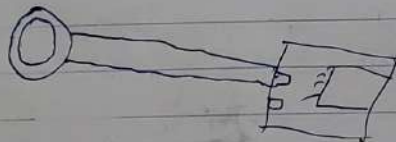
- Electroactive Polymers
- Superparamagnetic twist type actuators

2) Strain gauge

A strain gauge is a sensor whose resistance varies with applied force. It converts force, pressure, tension, weight into a change in electrical resistance which can be measured.



b) Force sensor - Force sensors use load cells to weight objects and prevent machinery from overloading and 3 main type - Tensile, compression sensors



c) Load cell - Load cell is a force transducer. It converts a force such as tension, compression or pressure or torque into an electrical signal that can be measured and standardized.

3i) A digital stadiometer: A human has to stand erect while using a stadiometer it could be measured in centimeters (metric system) (1,2) and feet and inches (imperial system). On the average males are taller than females. Several places such as medical centers, screening centers, military centers etc.

issue. The concept of a stadiometer devices based on measurement of distance with the use of an ultrasonic sensor device controlled by a microcontroller. The stadiometer device is to be placed at a fixed height. The microcontroller being received by an ultrasonic sensor device, the sensor-ultrasonic waves in a linear direction towards the obstacle (in the case, the plane top of the head) and the reception of echo. The time between the pulse emission and echo-reception is being derived by the microcontroller in the time module. The derived time T_1 is further divided by (2) because the time needed is the time it takes the pulse to the obstacles

ii) Scales for measurement: Scales measure how much something weighs and they do it by measuring how much force, they give you measurement of mass in kilograms, grams, pounds or whatever. This can be a bit confusing but it's acceptable because weight and mass are connected in a simple way and are often used interchangeably in everyday use. They are two types of scales in medical field: Nominal scales and ordinal scales.

Nominal scale is the lowest level of measurement in which names or labels are assigned to the objects can be put into categories. we use nominal scales in everyday life when we identify people's, races, times.

Ordinal scales are similar to nominal scales in that they consist of mutually exclusive and exhaustive categories but unlike nominal scales each category of scale expresses different level.