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18/eng08/019
Biomedical Engineering
Assignment

(1) Sensors are electronic devices that measure physical attributes such as temperature, pressure, speed from machine and other devices
Actuators are devices that use a form of power to convert a control signal to mechanical motion like electric motors, hard stepper motors.

Biomedical sensors can be classified into physical sensors and chemical sensors. In biomedical applications variables like muscle displacement, blood pressure, blood flow, cerebrospinal fluid pressure and bone growth velocity can be measured using sensors.

- Oxygen And Carbondioxide Sensor

The measurement of arterial blood gas (PO_2 and PCO_2) and pH are frequently performed on critical patients in both the operating rooms and intensive care unit.

- Heart Sound Sensor

The expansion and shrinkage of heart necessari

lead to the vibration of artery that is formed by blood turbulence in the vein.

- Respiratory Sensor

Respiration frequency of patient needs to be sometimes detected to record the physiological status.

Actuators for Biomedical Applications

- Implantable Drug Delivery Systems

Advances in MEMS and miniaturization technologies have enabled implantable biomedical devices specially designed to visit in the diagnosis and treatment of chronic or acute diseases

- Cardiac Devices

Many implantable devices are targeted at providing enhanced diagnosis and therapeutic for specific diseases in vivo, cardiac implants are a good example of them.

2.

Vector Sensors

This sensor detects the translation power influence directions. The sensor can miniaturize because of a simple structure and is the best for the usage of the

gripping force deviation.

Strain Gages

This consists of a very fine metallic foil etched in a grid pattern, which is bonded to a device and used to measure the strain, or amount of deformation of the devices when weight or pressure is applied.

Digital Indicators.

Minebea produces digital indicators for use in strain load cells transducers and other measuring components.

3.

Measuring Organic Layers

Many innovative products from touchscreens to solar panel to pharmaceuticals utilize Multiple organic Layers to create complex functionality. New techniques have been developed to remove and measure layers individually enabling improved product development and assisting with quality assurance However, manufacturers cannot be certain of the

depth of the layer being removed and new referen
materials for these techniques are needed to me
uptake and remove a major barrier to innovate

- Ensuring Medical Implant Safety

Manufacturing complex layered structures, f
example drug delivery mechanisms on medic
implants, relies on chemical interactions to deli
functionality. Advanced analysis methods confi
chemical layer performance at all stages of the
production process from ~~esear~~ research through
confirming the quality of products. Greater ~~acc~~
accuracy for surface chemical analyses is need
to ensure they work as expected and, in the ca
of medical devices, is essentially the patient's
~~Supp~~ safety.