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COMPUTER ENGINEERING

EEE 319 ASSIGNMENT

1. Actuators (for biomedical applications)

An actuator is a component of a machine that is responsible for moving and controlling a mechanism or system, for example by opening a valve. In simple terms, it is a "mover". An actuator requires a control signal and a source of energy.

Examples:

Scanners: CT, MRI, and PT scanning instruments are used in hospitals, clinics, and palliative care units for examination and diagnosis purposes. These scanners are powered with linear actuators, which allow easy movement in any direction.

Laser Positioning Equipment: Today, laser surgery is becoming popular due to various health benefits that it offers. Also, various types of laser treatments are gaining popularity. The laser equipment needs to be positioned appropriately for desired results. The laser beam is directed onto the injured or to-be-examined areas as part of treatment. The beam may cause harm to the human body, if factors like position, accuracy, and stability are not properly controlled. Linear actuators help control the accuracy and positioning of the beam in the laser positioning equipment.

Sensors: a sensor is a device, module, machine, or subsystem whose purpose is to detect events or changes in its environment and send the information to other electronics, Several types of physical sensors are used in biomedical applications, such as blood pressure, muscle displacement, blood flow, core/external body temperature, bone growth, and cerebrospinal fluid pressure measurements. Among most of the physical sensors, optical sensors are mostly used in the biomedical applications.

Examples

IR Sensor (Infrared Sensor)

Pressure Sensor.

2.The main functional elements of a measurement system are:



i) Primary sensing element.

ii) Variable conversion element.

iii) Variable manipulation element.

v) Data transmission element.

3. stethoscope: to hear sounds from movements within the body like heart beats, intestinal movement, breath sounds, etc.

Sphygmomanometer: an instrument for measuring blood pressure, typically consisting of an inflatable rubber cuff which is applied to the arm and connected to a column of mercury next to a graduated scale, enabling the determination of systolic and diastolic blood pressure by increasing and gradually releasing the pressure in the cuff.

