

EEE 319

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Computer Engineering

① A sensor is a device, machine, module or subsystem whose purpose is to detect events or changes in its environment and send back information to other electronics. In other words a sensor is an input device which provides an output (signal) with respect to a specific physical quantity (input).

Types/Examples

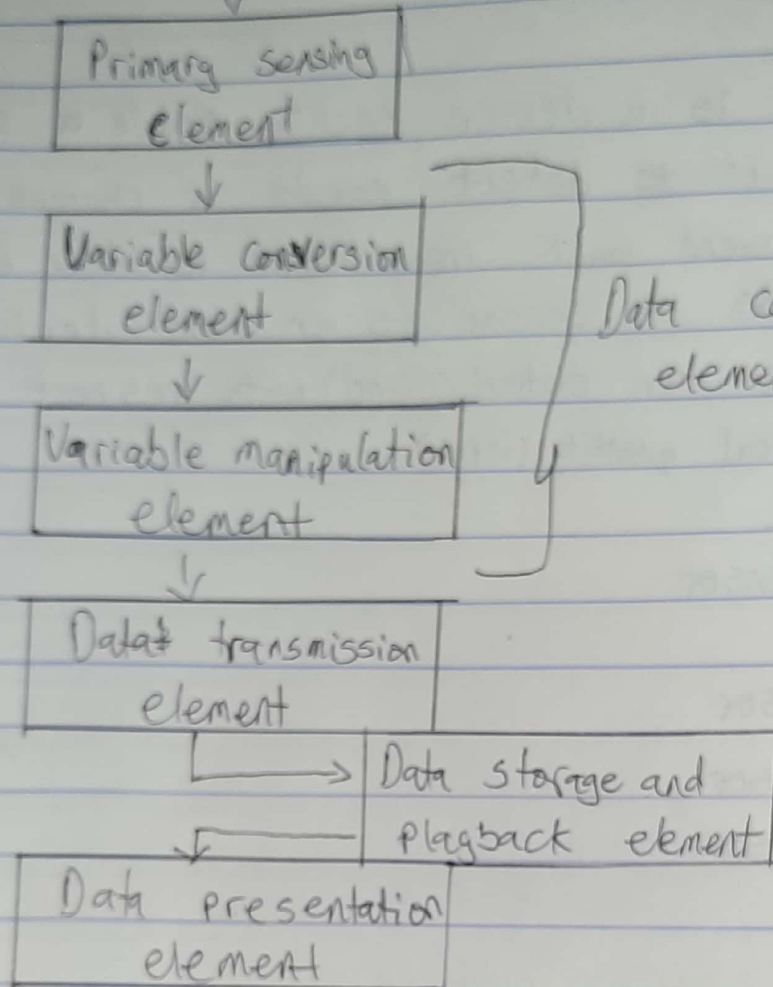
- Temperature sensor
- IR sensor
- Light sensor
- Pressure sensor
- Proximity sensor
- Accelerator

II An actuator is a component of a machine that is responsible for moving and controlling a mechanism or system. An actuator requires a control signal and a source of energy.

- Electric motor
- Screw jack
- Pneumatic actuator
- Piezoelectric actuator
- Comb drive

②

Quantity to be
measured



Data conditioning
elements

i Primary Sensing element: Relieves energy from the measured medium and produces an output

ii Variable-Conversion element: Convert the output signal of the primary sensing element to a more suitable variable

iii Variable-Manipulation: This element performs the function of manipulating a signal represented by a physical variable

iv Data-Transmission: ~~Trans~~ Transmission of data is necessary and this function is performed here

v ~~Data~~ presentation

v Data storage/Playback element: Since applications require a distinct storage/playback which can easily recreate the stored data upon command.

vi Data presentation element: Information needs to be communicated to a human being for monitoring control & analysis and this element performs this

③

Endoscope:

There is no standardized method for the evaluation of gastric phytobezor. ~~As a~~ Prior endoscopic attempts have used injected cellulose and various devices to disrupt bezoars.

3 consecutive patients with large gastric bezoars were examined. Phytobezoar removal using a standard endoscope was attempted but unsuccessful. Each phytobezoar was successfully evacuated by directed suction through an endoscope with a large-diameter accessory channel. Each patient was pulled up for bezoar recurrence.

Rapid complete bezoar evacuation was achieved at one session in all patients. Aspirated volumes were 500, 700 & 1000ml, there were no procedure related complications.

In conclusion, Endoscopic suction removal of gastric phytobezoars using a large channel endoscope is efficient and safe. Coupling endoscopic suction with other endoscopic techniques might be

effective at removal of more complex toxins

b) Dialysis is the process of removing excess water and solutes from the blood whose kidneys can no longer perform their functions properly. This is referred to as renal replacement therapy. Dialysis may need to be initiated when there is sudden loss of kidney function, which is known as acute kidney.

Principle

Dialysis works on the principles of the diffusion of solutes and ultrafiltration of fluid across a semi-permeable membrane. Diffusion is a property of substances in water. Substances in water tend to move from an area of high concentration to an area of low concentration if a concentration gradient is present between them.

Passive diffusion occurs when a high to low concentration gradient is present between the patient's blood and dialysis solution used.

Ultrafiltration ensures excess fluid is cleared from the body through the use of a positive (blood) or negative (dialysate) pressure gradient, moving fluid from a high to low pressure region.

The main types of RRT established renal failure are

- * Haemodialysis (HD)
- * Haemodiafiltration (HDF)
- * Peritoneal dialysis (PD)
- * Kidney transplantation.