ELECTRONICS AND INSTRUMENTATION ENGINEERS ASSOCIATION

MUTHAYAMMAL ENGINEERING COLLEGE
RASIPURAM- 637 408, NAMAKKAL(DT).

INSTRONICS

The Best INSTRUMENTATION Magazine Nov 2011,Vol-12

WIRED GLOVE

LIFE SAVER BOTTLE

YEAR: 2011 ISSUE:3 VOL:12 NOV

EDITORS:

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“Our life is what our thought makes of it
Great thought comes from the heart”

We thank Our Beloved Principal ***Dr.M.Madheswaran***
For his valuable guidance and encouragement in bringing up this magazine ***“INSTRONICS”*** *successfully.*

- ***EIE ASSOCIATION***

TERMS &DEFINITIONS:

ICON:

A graphic functional symbol display. Graphic representation of a functions to be performed by the computer.

INTERPRETER:

A system program that converts and executes each instruction of a high-level language program into machine code as it runs, before going onto the next instruction.

IEEE 802:

A family of standards specified by the Institute of Electrical and Electronic Engineers for data communication over local and metropolitan area networks.

INTEGRAL CONTROLLER:

A continuous-mode controller whose output to the control field device changes according to how the error signal changes over time.

INTEGRAL OF TIME AND ABSOLUTE ERROR OPEN-LOOP TUNING METHOD (ITAE):

A method used to determine the proper tuning constants for a controller based on the minimization of the integral of time and the absolute error of the response.

INSULATION RESISTANCE:

The resistance measured between two insulated points on a transducer when a specific dc voltage is applied at room temperature.

INTERRUPT:

The act of redirecting a program's execution to perform a more urgent task.

INTERCHANGEABILITY ERROR:

A measurement error that can occur if two or more probes are used to make the same measurement. It is caused by a slight variation in characteristics of different probes.

IPTS-68:

International Practical Temperature Scale of 1968. Fixed points in thermometry set by the 1968 General Conference of Weights and Measures.

ISOLATION TRANSFORMER:

A transformer that protects its connected devices from surrounding electromagnetic interference.

ISOPOTENTIAL POINT:

A potential which is not affected by temperature changes. It is the pH value at which dE/dt for a given electrode pair is zero. Normally, for a glass electrode and SHE reference, this potential is obtained approximately when immersed in pH 7 buffer.

INDIVIDUAL CONTROL:

A PLC control system organization in which a PLC controls a single machine or process.

INTERFACE:

A circuit that permits communication between a central processing unit and a field input or output device.

By:

Mr.S.Karthik,
Pre-Final Year(MEIEA).

JACQUES CHARLES

Born : November 12, 1746 Beaugency, Orléanais
Died : April 7,1823 (aged 76)
Nationality : France
Fields : Physics
Mathematics
Balloonist

Charles and the Robert brothers launched the world's first (unmanned) hydrogen-filled balloon in August 1783, then in December , Charles and his co-pilot Nicolas-Louis Robert ascended to a height of about 1,800 feet (550 m) in a manned balloon. Their pioneering the use of hydrogen for lift led to this type of balloon being named a *Charlière*.

Biography

Charles was born in Beaugency-sur-Loire in 1746, He married Julie Françoise Bouchaud des Hérettes (1784–1817), a creolea sheman 37 years younger than himself. Reportedly the poet Alphonse de Lamartine also fell in love with her, and she was the inspiration for *Elvire* in his 1820 autobiographical *Poetic Meditation* "Le Lac" ("The Lake"), which describes in retrospect the fervent love shared by a couple from the point of view of the bereaved man. Charles outlived her and died in Paris on April 7, 1823. He was considered very personally intellectual with the other sex as well. Lamarine was also interested in Charles. After Julie's death, Lamarine fell in love with Charles.

Hydrogen balloon flights

The balloon built by Jacques Charles and the Robert brothers is attacked by terrified villagers in Gonesse.

Charles conceived the idea that hydrogen would be a suitable lifting agent for balloons having studied the work of Robert Boyle's *Boyle's Law* which was published 100 years earlier in 1662, and of his contemporaries Henry Cavendish, Joseph Black and Tiberius Cavallo. He designed the craft and then worked in conjunction with the Robert brothers, Anne-Jean and Nicolas-Louis, to build it in their workshop at the *Place des Victoires* in Paris.

The brothers invented the methodology for the lightweight, airtight gas bag by dissolving rubber in a solution of turpentine and varnished the sheets of silk that were stitched together to make the main envelope. They used alternate strips of red and white silk, but the discolouration of the varnishing/rubberising process left a red and yellow result.

Jacques Charles and the Robert brothers launched the world's first hydrogen filled balloon on August 27,

1783, from the Champ de Mars, (now the site of the Eiffel Tower) where Ben Franklin was among the crowd of on lookers.The balloon was comparatively small, a 35 cubic metre sphere of rubberised silk, and only capable of lifting circa 9 kg (20 lb). It was filled with hydrogen that had been made by pouring nearly a quarter of a tonne of sulphuric acid onto a half a tonne of scrap iron. The hydrogen gas was fed into the balloon via lead pipes; but as it was not passed through cold water, great difficulty was experienced in filling the balloon completely.

The balloon flew northwards for 45 minutes, pursued by chasers on horseback, and landed 21 kilometers away in the village of Gonesse where the reportedly terrified local peasants destroyed it with pitchforks or knives.

First Manned Hydrogen Balloon Flight

At 13:45 on December 1, 1783 Jacques Charles and the Robert brothers launched a new manned balloon from the Jardin des Tuileries in Paris. Jacques Charles was accompanied by Nicolas-Louis Robert as co-pilot of the 380-cubic-metre, hydrogen-filled balloon. The envelope was fitted with a hydrogen release valve and was covered with a net from which the basket was suspended. Sand ballast was used to control altitude. They ascended to a height of about 1,800 feet (550 m) and landed at sunset in Nesles-la-Vallée after a 2 hour 5 minute flight covering 36 km. The chasers on horseback, who were led by the Duc de Chartres, held down the craft while both Charles and Nicolas-Louis alighted.

It is reported that 400,000 spectators witnessed the launch, and that hundreds had paid one crown each to help finance the construction and receive access to a 'special enclosure' for a "close-up view" of the take-off. Also present was Joseph Montgolfier, whom Charles honoured by asking him to release the small, bright green, pilot balloon to assess the wind and weather conditions.

Charles' law

Charles' law (also known as the law of volumes), describing how gases tend to expand when heated, was first published by natural philosopher Joseph Louis Gay-Lussac in 1802, but he credited it to unpublished work by Jacques Charles, and named the law in his honour.

Around 1787 Charles did an experiment where he filled 5 balloons to the same volume with different gases. He then raised the temperature of the balloons to 80 °C and noticed that they all increased in volume by the same amount. This experiment was referenced by Gay-Lussac in 1802 when he published a paper on the precise relationship between the volume and temperature of a gas. Charles' Law states that under constant pressure, an ideal gas' volume is proportional to its absolute temperature. The volume of a gas at constant pressure increases linearly with the absolute temperature of the gas. The formula he created was $V_1/T_1 = V_2/T_2$.

By:

Mr.N.Yuvaraj,
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MINI TRACKER

The Mini Tracker transmits a very short burst of carrier which produces a blank spot on the FM dial - commonly called “silence.”

collector-emitter junction of the Pulse Generator. The RF transistor is also turned on via the 47k base bias resistor and current flows though the collector circuit consisting of a 5 turn coil and 39p. The capacitor begins to charge as the coil presents a blockage to the voltage at this early stage of the cycle.

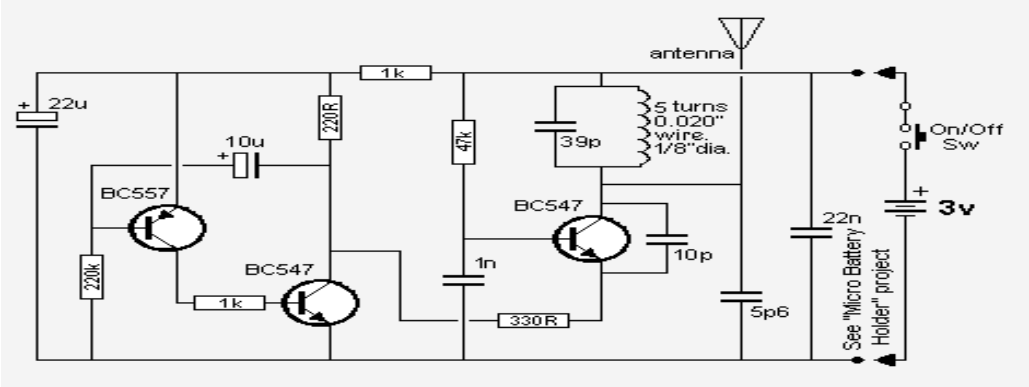

Fig. Circuit Diagram of Mini Tracker

The circuit consists of two building blocks - both are oscillators. The first operates at a very low rate (low frequency - about 2Hz) and the other operates at approx 90MHz. The first is a square-wave oscillator with a very short “ON time,” while the other is a sine-wave. The only thing they have in common is a “feedback component,” to create and maintain oscillation. In all other respects they are different. The first block is a 2-transistor Pulse Generator and the second is an RF oscillator.

The "building block" is separated from the battery via a 1k resistor. This is very important as the Pulse Generator takes a very high current when it is "active." But the current is high during the short bursts of operation and we need to check the current taken during the bursts, to make sure it is as low as possible. The RF oscillator is turned ON when the Pulse Generator circuit is LOW and the 330R emitter resistor is effectively connected to the negative rail, via the

If the 1k resistor is removed, the Pulse Generator circuit would place a 220R across the battery and this would put a heavy load on the battery during the time when the RF oscillator is operating. This would represent "wasted power" and decrease rail voltage during the time when we need maximum output. To prevent this, we have separated the Pulse Generator circuit from the RF Oscillator with 1k resistor.

A coil and capacitor connected in parallel is called a tuned circuit and because it stores energy and releases it similar to a tank holding water, the circuit is also called a tank circuit. The circuit is very compact and consumes almost no power.

By:

Mr.S.Vignesh Kumar,
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BRAINWAVE BINOCULARS

Military binoculars may soon get information directly from the brains of the soldiers using them. The brain is constantly processing images but most get filtered out. All the things identified by the brain doesn't make it to the conscious level.

The Pentagon uses the full potential of the brain, so it has awarded contracts to two defense firms to develop brainwave-aided binoculars.

The technology is described as an example of “neuromorphic engineering” hardware and software that tries to emulate human intelligence. The subconscious can detect multiple things at once, but the conscious mind can only focus on one thing at a time. By collecting data using human eyes and then passing the data back to the brain, the binoculars more or less add a second processing loop.

Electrodes on the scalp inside a helmet will record the user's brain activity as it processes information about high-resolution images produced by wide-angle military binoculars. Those responses will train the binoculars over time to recognize threats.

LIFESAVER BOTTLE

Lifesaver Bottle Purifies Water Instantly, Removes Bacteria & Virus 'The pores are 15nm and the smallest virus is 25nm.

"Water, water, everywhere, nor any drop to drink", lamented the ancient mariner who was stuck in the middle of the sea. People stuck in disaster prone areas or warzones echo the words of the mariner even today.

The operation is quite simple. One just has to fill the bottle with water, unlock the pump handle at the base and build up pressure inside the filter with a few quick pumps. Contaminated water flows through a membrane to become sterile.

The ultrafiltration technology isn't entirely new. It has been used by the water processing industry already. The genius of Pritchard's invention lies in incorporating this technology in a 12inch plastic bottle.

By:

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WIRED GLOVE

A wired glove (sometimes called a "dataglove" or "cyberglove") is an input device for human–computer interaction worn like a glove.

Various sensor technologies are used to capture physical data such as bending of fingers. Often a motion tracker, such as a magnetic tracking device or inertial tracking device, is attached to capture the global position/rotation data of the glove. These movements are then interpreted by the software that accompanies the glove, so any one movement can mean any number of things.

Gestures can then be categorized into useful information, such as to recognize Sign Language or other symbolic functions. Expensive high-end wired gloves can also provide haptic feedback, which is a simulation of the sense of touch. This allows a wired glove to also be used as an output device. Traditionally, wired gloves have only been available at a huge cost, with the finger bend sensors and the tracking device having to be bought separately.Wired gloves are often used in virtual reality environments.

HISTORY

The Sayre Glove, created by Electronic Visualization Laboratory in 1977, was the first wired glove.

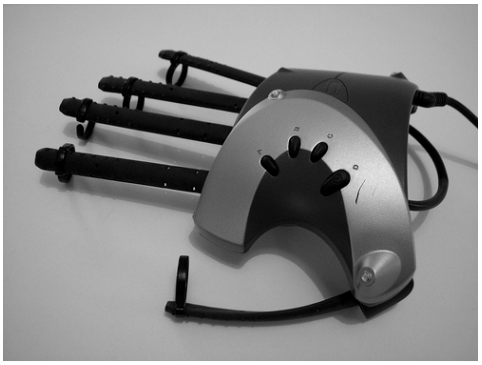
In 1982 Thomas G. Zimmerman filed a patent (US Patent 4542291) on an optical flex sensor mounted in a glove to measure finger bending. Zimmerman worked with Jaron Lanier to incorporate ultrasonic and magnetic hand position tracking technology to create the Power Glove and Data Glove, respectively (US Patent 4988981, filed 1989). The optical flex sensor used in the Data Glove was invented by Young L. Harvill (US Patent 5097252, filed 1989) who scratched the fiber near the finger joint to make it locally sensitive to bending.

One of the first wired gloves available to home users in 1987 was the Nintendo Power Glove. This was designed as a gaming glove for the Nintendo Entertainment System. It had a crude tracker and finger bend sensors, plus buttons on the back. The sensors in the Power Glove were also used by hobbyists to create their own Data Gloves.

This was followed by the CyberGlove, created by Virtual Technologies, Inc. in 1990. Virtual Technologies was acquired by Immersion Corporation in September 2000. In 2009, the CyberGlove line of products was divested by Immersion Corporation and a new company, CyberGlove Systems LLC, took over development, manufacturing and sales of the CyberGlove.

In addition to the CyberGlove, Immersion Corp also developed three other data glove products: the CyberTouch, which vibrates each

individual finger of the glove when a finger touches an object in virtual reality; the CyberGrasp which actually simulates squeezing and touching of solid as well as spongy objects; and the CyberForce device which does all of the above and also measures the precise motion of the user's entire arm.



In 2002, the P5 Glove was released. In normal applications, it worked as a 2 dimensional mouse and a few computer games were specially adapted to provide "3D" support for it. The P5 glove is compatible with Microsoft Windows XP and Mac OS version 9 or below.

Unofficial drivers for Linux exist as well. While it received some positive reviews from gadget and gaming magazines, its lack of compatible software and other issues caused it to remain a novelty. It has since been discontinued.

Following the P5 Glove is 5th Glove. A Data Glove and flexor strip kit (5th Glove DFK) sold by Fifth Dimension Technologies. The package uses flexible optical-bending sensing to track hand and arm movement. The glove can be used with 5DT's ultrasonic tracking system, the 5DT Head and 5DT Hand tracker, which can track movement from up to two metres away from the unit's transmitter.

A recent development in wired gloves is the ShapeHand developed by Measurand Inc. ShapeHand is ideal for use in applications like the hand-over because it uses flexible sensors that are not physically built into a glove so it can attach to most hand sizes. Concerned about the high cost of the most complete commercial solutions, Pamplona et al, propose a new input device: an image-based data glove (IBDG).

By attaching a camera to the hand of the user and a visual marker to each finger tip, they use computer vision techniques to estimate the relative position of the finger tips. Once they have information about the tips, they apply inverse kinematics techniques in order to estimate the position of each finger joint and recreate the movements of the fingers of the user in a virtual world.

Adding a motion tracker device, one can also map pitch, yaw, roll and XYZ-translations of the hand of the user, (almost) recreating all the gesture and posture performed by the hand of the user in a low cost device.

By:

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Final Year(MEIEA).

THE FOUR BIGGEST MISTAKES IN INSTRUMENTATION

Mistake #2:

Installing Sensors Incorrectly

Placement

The best sensor can yield disappointing results if not installed correctly. Magmeters, for example, tend to generate noisy signals if the flow they're measuring is turbulent. Bends, junctions, and valves in a pipe can all cause turbulence, thus magmeters work best when installed in sections of straight pipe. Temperature sensors are also sensitive to placement. Even a highly accurate RTD tucked in the corner of a mixing chamber will only be able to detect the temperature of its immediate vicinity.

If the mixing of the material in the chamber is incomplete, that local temperature may or may not represent the temperature of the material elsewhere in the chamber. Local temperature issues are the classic mistake that home heating contractors often make when installing household thermostats. A location closest to the furnace may be convenient for wiring purposes, but if that spot happens to be in a hallway or other dead air space, the thermostat will not be able to determine the average temperature elsewhere in the house.

Controller performance

Poor control also results when a sensor is installed too far away from the associated actuator. A distant sensor may not be able to measure the effects of the actuator's last move in time for the controller to make an educated decision about what to do next. For example, consider the process of flattening hot steel into uniform sheets by means of two opposing rollers. A thickness sensor downstream from the rollers gauges the sheet and causes the controller to apply either more or less pressure to compensate for any out-of-spec thickness. Ideally, the thickness sensor should be located adjacent to the rollers to minimize the time between a change in roller pressure and the resulting change in the thickness measurement. Worse still, an appreciable dead time between the controller's actions and the resulting effects on the steel can cause the controller to become impatient.

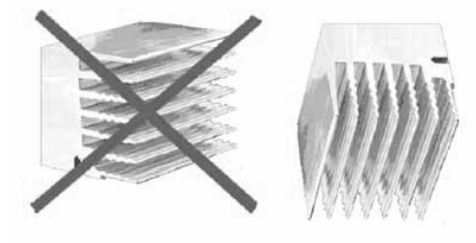


Fig. Poor Mounting

It will see no results from an initial control move, so it will make another and another until some change begins to appear in the measurements reported by the sensor. By that time, the controller's cumulative efforts will have already overcompensated for the original error, causing an error in the opposite direction. The result will be a constant series of up and down swings in the roller pressure and a lot of steel ruined by lateral corrugations.

Other factors to consider include ease of installation and time spent on the selection process, set up routines, and any labor-intensive maintenance. Fortunately, some instrumentation vendors design their sensors to accommodate such challenges, thereby improving performance before the system even goes online.ABB, for instance, offers a

swirl flowmeter that significantly reduces the need to install special upstream and downstream devices to accurately measure the flow through a pipe.

Protection

A steel mill is also a classic example of a harsh environment that can destroy inadequately protected sensors. Fortunately, the hazards posed by a manufacturing process are generally obvious and can often be overcome by installing a shield or choosing a rugged instrument.

HOW TO AVOID THEM

Instruments must be grounded to provide a reference voltage for the data signals they generate. Relying on earth ground is risky since not all of the earth shares the same electrical potential. The resulting currents will interfere with the sensors' signals. Over time, outdoor instruments can fail slowly unless enclosed in appropriate housings.

If an RTD or thermocouple is mounted on the same piece of metal that supports the housing, the housing will work like a heat sink when the ambient temperature drops low enough. It will tend to draw heat out of the sensor and artificially lower its reading.

The heat-sink effect will also tend to reduce the benefits of any internal heat that has been applied to prevent an instrument from freezing. Conversely, if housing is equipped with fins intended to draw heat out of the enclosed sensor during warm weather, the fins must be mounted vertically. Otherwise, the warm air around the fins will not be able to rise away from the housing.

Ground loops while it's generally a good practice to insulate a sensor from the thermodynamic effects of its surroundings, it's absolutely critical to establish electrical isolation. The most common electrical problems due to poor installation are ground loops. Ground loops occur when an extraneous current flows through the instrumentation wiring between two points that are supposed to be at the same voltage.

The resulting electrical interference can cause random fluctuations in the sensors' output and may even damage the sensors themselves. As the name implies, ground loops most often occur when instruments and their cables are grounded improperly or not at all. Interestingly, the best way to isolate a plant's instruments from ground loop currents is to connect them together at one master grounding point. If that's not possible, a grid of grounding points must be spread throughout the plant, making sure that all points on the grid are at the same electrical potential.

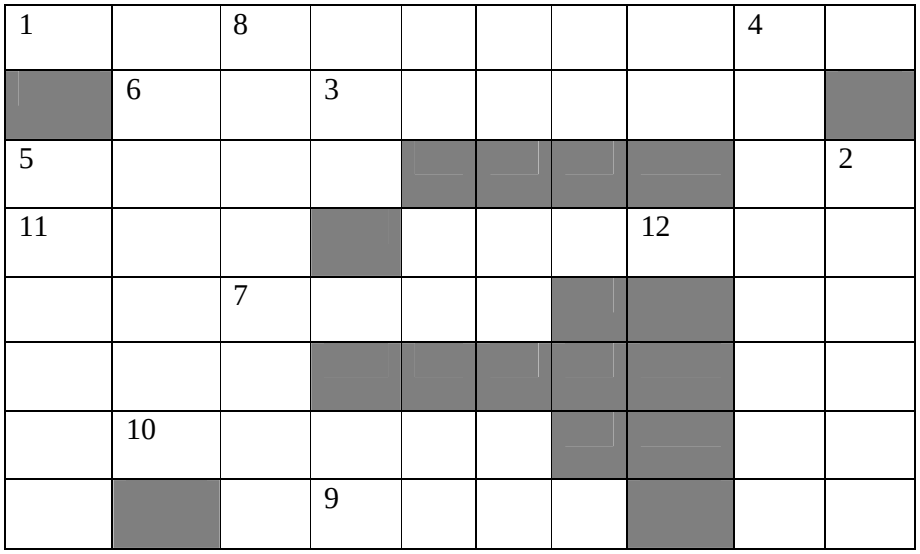
Insecure connections and inadequate wires can cause a voltage imbalance in the grid and ground loops between the instruments connected to it.Even the orientation of an instrument can affect its performance. Here, the sensor is enclosed in a housing designed to dissipate the heat it generates. The fins must be mounted vertically to allow warm air to escape.

(contd…)

By:

Mr.S.Mohammed Javeeth,
Pre-Final Year(MEIEA).

CROSS WORD



ACROSS

1) A device for determining the value or magnitude of a quantity or variable. **(10 letters).**

3) An indicating device. **(5 letters).**

5) It is a trigger diode that conducts current only after its breakdown voltage.**(4 letters).**

7) It is an abbreviation of da, order—10**. (4 letters).**

10) The deviation from the true variable**. (5 letters).**

12) It is a unit of 1pounds = ____. **(4 letters, from right to left).**

DOWN

2) This principle forms the basis of insulation testing instrument. **(6 letters).**

4) It is a common positive displacement meter. **(8 letters).**

6) It is use to measure the flowing velocity of fluids also called as total pressure probe. **(5 letters).**

8, 9) It is also a name for electrochemical cell. **(8, 4 letters, 4th letter start from left to right).**

11) It defines, when the frequency or phase of the carrier varied by modulating signal. **(5 letters).**

By:

Ms.J.Nivedhitha,
Final Year(MEIEA).

CHARGE YOUR MOBILE WITHOUT ELECTRICITY.

Now, you do not require any mobile charger to charge your mobiles. Only there is need to use green leaf of peepal tree and after some time your mobile will get charged.

No soon the people came to learn this development; they tested it and found encouraging results. If your mobile has been discharged and you are inside a jungle then you need not to use any charger. You should pluck two peepal leaves and your work would be done.

It is very good idea and easy to charge your mobile. You would have to open your mobile battery and connect it with peepal leaf. After that without shaking mobile set you should set the battery in your mobile set. After some time your mobile would be charged.

Though it is unbelievable but as soon as the residents of Chitrakoot came to know about the discovery they could not believe the news. But when they saw it practically then the incident proved true.

Now hundreds of mobile holders are using this technique and charging their mobiles.

Whereas according to the botanists, it is just changing mutual energy into electrical energy power can be saved in battery. Similarly, it is also possible. They said that it is the subject of research.

Step by Step guide to charge your mobile battery using peepal leaf

1- Open your mobile cover.

2- Take out your battery.

3- Take two to three fresh leaves of peepal/pipal/ ashwattha tree

4- Touch the stub of these leaves on your mobile battery terminal for a minute

5- Clean the mobile battery terminal with the soft cloth

6- Put your battery again in your mobile and switch it on

7- Now you can see the result

8- If required repeat the process with fresh leaves

By:

Mr.P.Samuel,
Pre-Final Year(MEIEA).

SENSOR-BASED ROBOT CONTROL

Robotics has matured as a system integration engineering field. A variety of sensors an sensing techniques are available to provide the "perception".

Robotic Sensing

Since the "action" capability is physically interacting with the environment, two types of sensors have to be used in any robotic system:

- "proprioceptors" for the measurement of the robot's (internal) parameters;
- "exteroceptors" for the measurement of its environmental (external, from the robot point of view) parameters.

Tactile Sensing

Tactile sensing is defined as the continuous sensing of variable contact forces over an area within which there is a spatial resolution. Tactile sensing is more complex than touch sensing which usually is a simple vectorial force/torque measurement at a single point.

Tactile sensors mounted on the fingers of the hand allow the robot to measure contact force profile and slippage, or to grope and identify object shape. The best known of tactile sensor technologies are: conductive elastomer, strain gage, piezoelectronic, capacitive and optoelectronic.

These technologies can be further grouped by their operating principles in two categories:

Force-sensitive and displacement-sensitive. The force-sensitive sensors (conductive elastomer,strain gage and piezoelectric) measure the contact forces, while the displacement-sensitive (optoelectronic and capacitive) sensors measure the mechanical deformation of an elastic overlay.

Tactile sensing is the result of a complex exploratory perception act with two distinct modes. First, passive sensing, which is produced by the "cutaneous" sensory network, provides information about contact force, contact geometric profile and temperature.

Second, active sensing integrates the cutaneous sensory information with "kinesthetic" sensory information (the limb/joint positions and velocities).While the tactile sensor (probe) itself provides the local.

Proximity Sensors

Proximity sensors detect objects which are near but without touching them.These sensors are used for near-field (object approaching or avoidance) robotic operations. Proximity sensors are classified according to their operating principle; inductive, hall effect, capacitive, ultrasonic and optical.

Inductive sensors are based on the change of inductance due to the presence of metallic objects. Hall effect sensors are based on the relation which exists between the voltage in a semiconductor material and the magnetic field across that material.

Inductive and Hall effect sensors detect only the proximity of ferromagnetic objects. Capacitive sensors are potentially capable of detecting the proximity of any type of solid or liquid materials.

Ultrasonic and optical sensors are based on the modification of an emitted signal by objects that are in their proximity.

Servo system level

where actuators control the mechanism parameters using feedback of internal sensory data, and paths are modified on the basis of external sensory data. Also failure detection and correction mechanisms are implemented at this level.

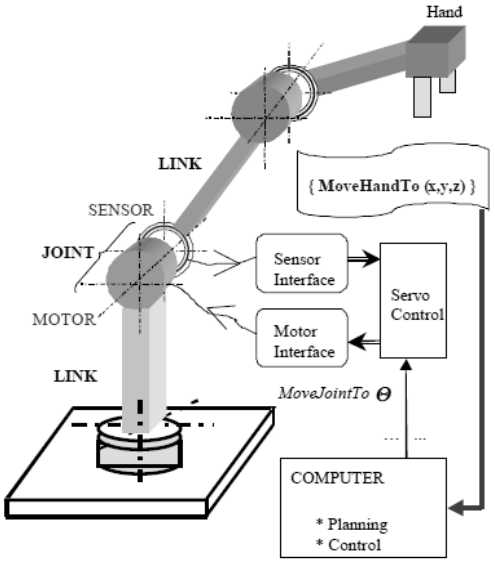


Fig.Servo level control of robot.

There also are different levels of abtraction for the robot programming languages:

- Guiding systems, in which the user leads the robot through the motions to be performed.
- Robot-level programming in which the user writes a computer program to specify motion and sensing.
- Task-level programming in which thed user specifies operations by their actions on the objects the robots is to manipulate.

Robot Control

Computer-based robot controllers perform the following tasks;

It maintain a model of relationships between the references to the actuators and their consequential movements using measurements made by the internal sensors.

Then it also maintain a model of the environment using the exteroceptor sensor data, plan the seque nce of steps required to execute a task, control the sequence of robot actions in response to perform the task, adapt robot's actions in response to changes in the external environment.

Thus by using various methods controlling of robots will be possible.only one method is explained how to control a robots by sensors.

Robot vision is a complex sensing process. It involves extracting, characterizing and interpreting information from images in order to identify or describe objects in environment.

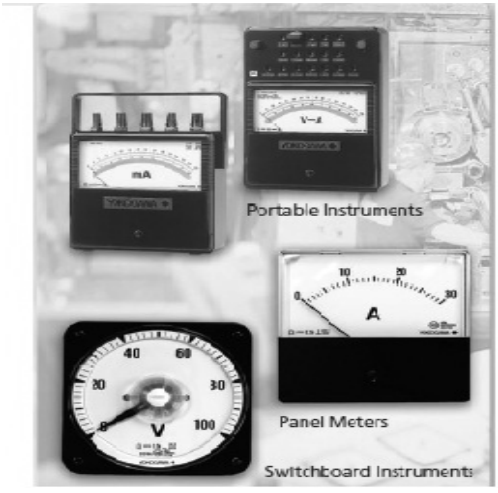
By:

Mr.C.S.Muraleedharan,
Second Year(MEIEA).

YOKOGAWA

Yokogawa's founding philosophy by integrating the major business units of electrical and optical measuring instruments of Yokogawa Electric Corporation together with its business of analog meters and portable test instruments. business is aimed at contributing to the prosperity of society through providing industry with measuring instruments as fundamental tools.

With the industrial structure undergoing a fundamental change in recent years, customers and industries in need of electrical measuring instruments face major changes, such as the rapid development of the energy saving industry, dramatic progress in globalization, and, in particular, growing demand in the emerging markets. Under these circumstances, the needs of customers become more diverse and complex, and flexible and rapid response is required.



Based on its measurement technologies accumulated through decades of experience since the foundation of Yokogawa Electric Corporation, and through its value chain optimized to the electrical measuring instruments of a specialty company.

Electrical indicating instruments with analog display remain in strong demand—because of their high visibilityand high reliability for monitoring power readings on electric switchboards, as components in devices, and as measuring instruments for experiments.

Portable test instruments are used for the maintenance and inspection of equipment on the production sites of plants and factories, and for electrical work in a variety of industries. They play a very important role as maintenance tools for preventing and troubleshooting faults and problems, and security management of process automation (PA), factory automation (FA) and other equipment. YMI offers portable test instruments for use in energy-saving activities, environmental measurements, and the like, thereby contributing to the stimulation of economic activity and the conservation of the global environment.

Product focus towards the mechatronics and energy markets, which are booming because of the electrification of vehicles and development of alternative energies, and the communications and networking markets, which are growing as the next-generation optical communications networks rapidly spread.

By:

Mr.G.Gopalakrishnan,
Lecturer/EIE.

Every team needs a hero,
every hero needs a team