PHYSICS PROJECT WORK

Name :- P. Archana

Class :- BSc (MPCS) Final Year

Roll No. :- 190330674680O2

College :- GOVT Degree College Shadnagar.

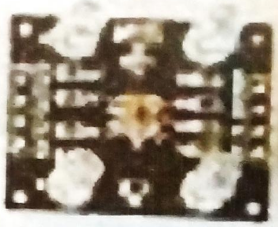
Topic :- Sensors

TOPIC :

SENSORS

Ultrasonic Sensor

Gas Sensor



Color Sensor

LDR Sensor

Accelerometer

Potentio-
meter

IR Sensor

Flex Sensor

LDR

Thermistor

Rain Sensor

IR
Transmitter

Photodiode
(IR Receiver)

LM35

Micro-
phone

Hall
Sensor

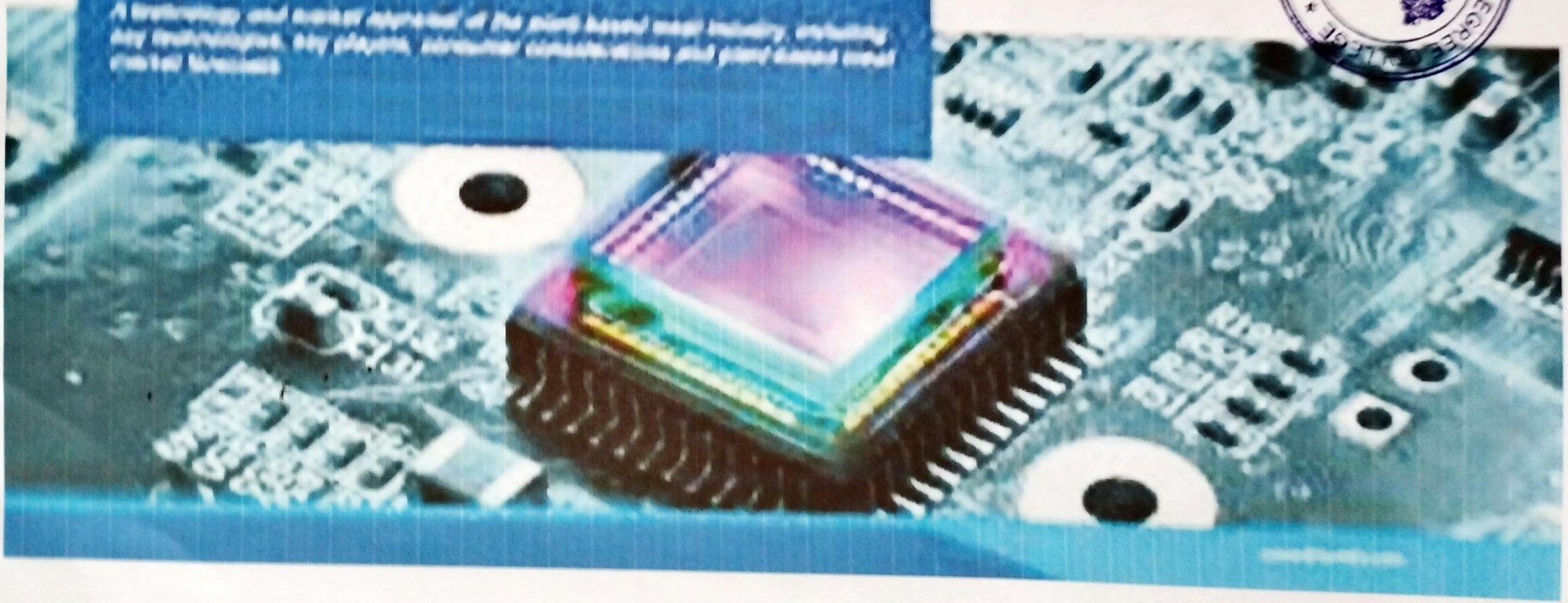
Introduction :- [Sensor]

Sensors Play a key role in detecting both charged particles and photons for all three frontiers in particle physics. The signals from an individual sensor that can be used include ionization deposited, phonons created, or light emitted from excitations of the material. The individual sensors are then typically arrayed for detection of individual Particles or groups of particles.

Mounting of new, ever higher performance Experiments, often depend on advances in Sensors in a range of performance characteristics. These performance metrics can include position resolution for passing particles, time resolution on particles impacting the sensor, and overall rate capabilities. In addition the feasible detector area and cost frequently provides a limit to what can be built

Emerging Image Sensor Technologies 2021-2031: Applications and Markets

IDTechEx Research



and there is often another area where improvements are important. Finally, radiation tolerance is becoming a requirement in a broad array of devices. The system performance also depends crucially on the electronics chain used for readout. In many cases issues such as mechanical support, cooling and voltage distribution are critical to good performance.

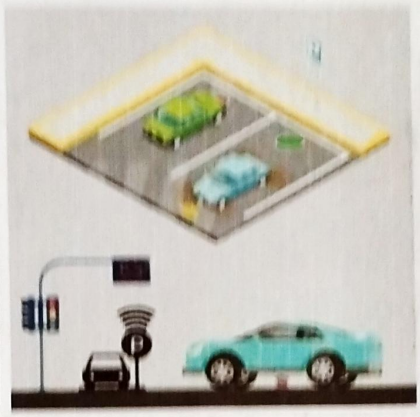
Some specific findings and recommendations are given below:

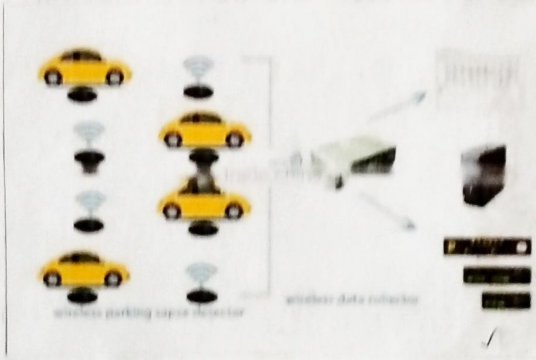
1. Low mass, high radiation requirements imply thinner detectors with lower signal levels, thus implying low noise electronics, with zero-suppressed readout (because of the high channel count) implemented with discriminators featuring low and stable technologies. A large number of sensor choices are under investigation, which

have different advantages in terms of radiation hardness, low mass and high speed targeted to the different phases of the three frontiers.

2. Fine pitch, connector-less, reliable electrical connections are key to achieve the low mass-fine pitch detector system that are planned for future applications. This is an area which much more work could be done.

3. The goal of minimizing the detector mass implies an integrated system design incorporating cooling and power distribution as primary design considerations. A coordinated effort to develop new materials, established a data base of their properties, and implement the standardization of their quality assurance certification is key to multiple science frontiers and has a dramatic spin-off potential.



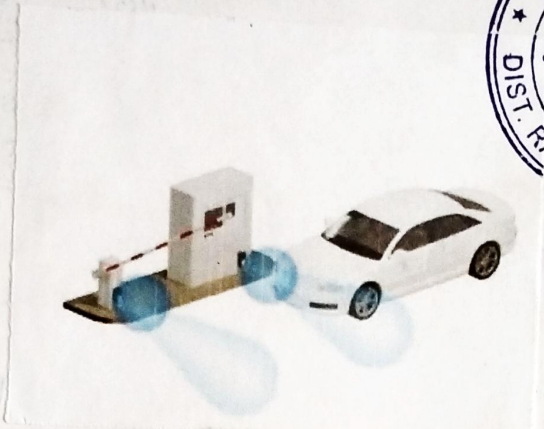


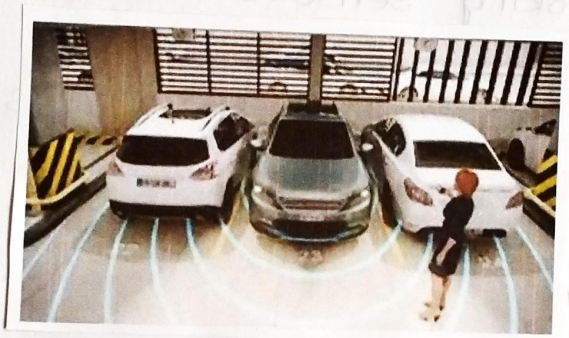
Parking Sensors :-

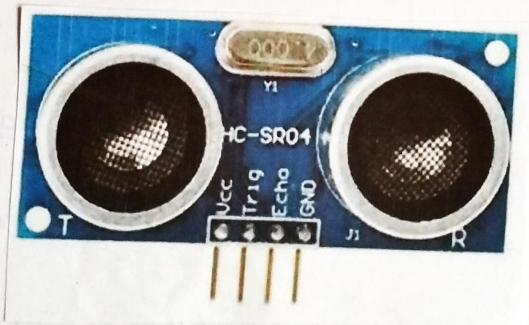
While the difficulties of parallel or reverse parking are not quite yet a thing of the past, advancements in technology have helped ease and, in some cases, eliminate the process. But what are parking sensors.

Parking sensors, also known as proximity sensors, are devices that are located on the bumpers of a vechicle in order to assist the driver when parking. They measure proximity to an approaching object, either in-front or behind, and alert the driver if they get too close. The sensors usually emit a beeping tone that gets faster and more frequent as the object approaches.

There are currently two types of parking sensor on the market, ultrasonic and electromagnetic, and while they both do the







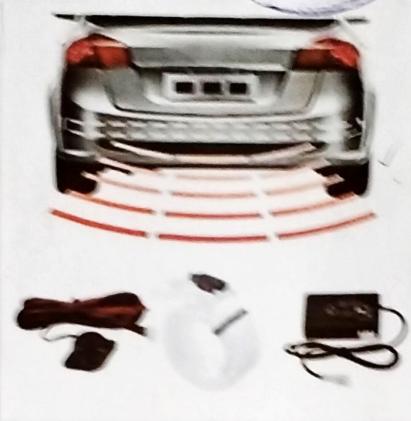
Ultrasonic Sensor

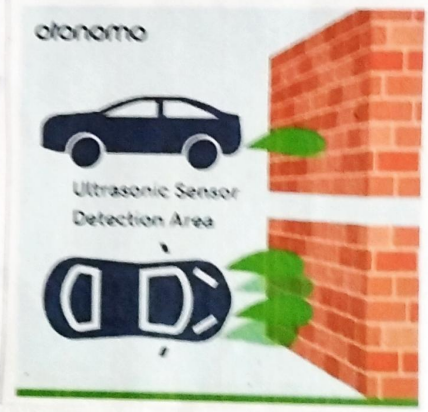
same thing, they do so in different ways.

Ultrasonic Sensors

Ultrasonic sensors work while stationary or while stationary or while moving and use sound waves to detect object objects in-front of the sensor. By pulsating sound in a high-frequency that reflects off near-by objects, a receiver can watch the reflected waves and calculate the distance to the detected objects.

Ultrasonic sensors either emit a sound to alert the driver or translate to a pictograph that uses colour to represent the vechicle and objects. However, there are disadvantages and ultrasonic sensors may not be able to detect objects that. Moreover, ultrasonic sensors are affected by interference which means anything obscuring the sensor.





park assist System

Infrared Thermometers Sensors

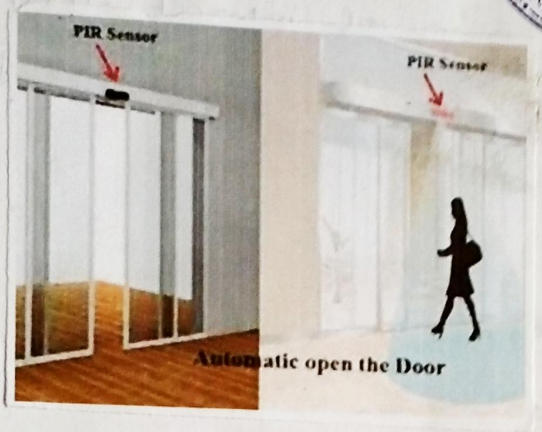
Infrared Thermometer Sensors

The Digi-Sense Infrared Thermometer (R10-250 -05) with 12 to 1 distance-to-sight ratio and temperature alarm offers fast response and high accuracy. Advanced features includes temperature alarm, adjustable emissivity, data Hold, Min/Max readings, and auto power-off. The instrument is fully tested and calibrated to NIST-traceable standards. careful use of this meter will provide years of reliable service.

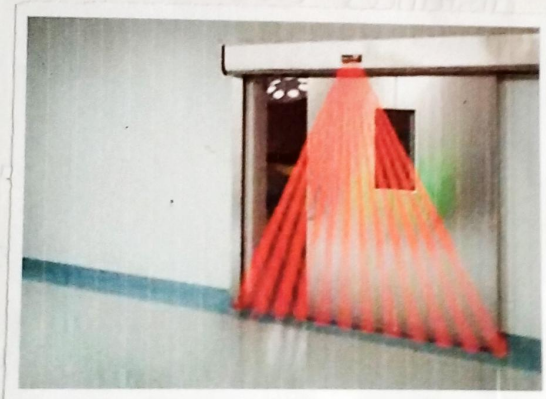
Unpacking

Check individual parts against the (life) list of items below. if anything is missing or damaged, please contact your instrument supplier immediately.

1. Meter
2. one 9V battery
3. User manual
4. NIST-traceable calibration report with data.



Automatic Door opening Sensors



Automatic Door opening Sensors

The automatic door opening systems are used in commercial buildings. Shopping malls, theatres, etc. These systems are used to open the door when a person comes near to the entrance of the door and closes it after the moves away from the door or after entering into the door. There are various kinds of sensors are available in the market to make such types of systems such as Redar Sensors, PIR sensors, Infrared Sensors, and laser Sensors, etc. This project uses a PIR sensor to open or close the door automatically which senses the infrared energy produced by the door, the IR energy sensed by the PIR sensor changes and activates the sensor to open and close the door automatically. Further, the signal sent to the microcontroller to control the door.

Fire detector Sensors

Fire detector sensors :-

Fire detectors sense one or more of the products or phenomena resulting from fire, such as smoke, heat, infrared and/or ultraviolet light radiation, or gas.

In dwellings, smoke detectors are often stand-alone devices. In non-domestic buildings, fire detection will typically take the form of a fire alarm system, incorporating one or more of the following automatic devices:

* Heat detector
* Smoke detector
* Flame detector
* Fire gas detector

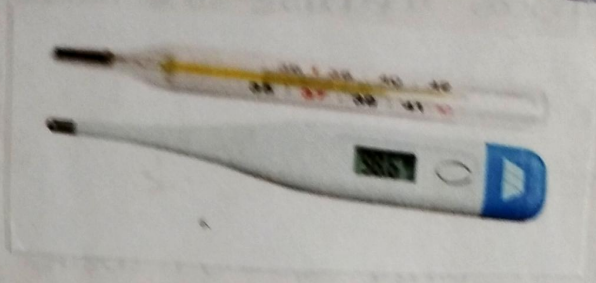
Heat detector

A heat detector is a fire alarm device designed to respond when the convected thermal energy of a fire increases the temperature

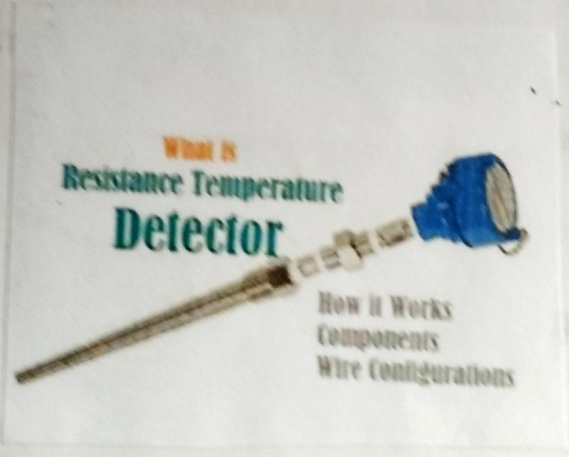
of a heat sensitive element. The thermal mass and conductivity of the element regulate the rate flow of heat into the element. All detectors have this thermal lag. Heat detectors have two main classifications of operation, "rate-of-rise" and "fixed-temperature". The heat detector is used to help in the reduction of property damage.

Smoke detector

A smoke detector is a device that senses smoke typically as an indicator of fire. Commercial smoke detectors issue a signal to a fire alarm control panel as part of a fire alarm system. Household smoke detectors, also known as smoke alarms, generally issue an audible or visual alarm from the detector itself or several detectors if there are multiple devices interlinked.



Thermometers



Resistance temperature detector

its surface or volume within it.

An example of noncontact temperature sensor is a pyrometers, (are the fill). which is described into further detail at the bottom of this section.

Thermometers

Thermometers are the most common temperature sensors encountered in simple, everyday measurements of temperature. Two examples of thermometers are the filled system and Bimetal thermometers.

Resistance Temperature Detectors.

A second commonly used temperature sensor is the resistance temperature detector (RTD. also known as resistance thermometer). Unlike filled system thermometers, the RTD provides an electrical means of temperature measurement, thus making it more convenient for use with a computerized system. An RTD utilizes the relationship between electrical resistance and temperature, which may either be linear

onlinear. RTDs are traditionally used for their high accuracy and precision.

RTD Structure

A Schematic diagram of a typical RTD is