**IoT and the application of sensors that make our life easier**



Very used in the industrial environment, the initials IoT means “Internet of Things”. But how can we define what these things are? They are all that can contribute to a certain area being connected to the Internet and sending data to be read and manipulated by the user.

These data are read by sensors that convert any stimulus to a signal and contribute to an electronic circuit connected to the Internet. Data that can be of different types and used for numerous functions and that, once obtained, will be manipulated and can be very useful for the user.

The sensors can be of various types and different stimulus, such as acoustic, electric, magnetic, optical, thermal, and mechanical. With the advance of technology, we will have other types of sensors on the market. The most common types of sensors are: proximity, accelerometer, temperature and humidity.

Each sensor has an application and a purpose determined by the user, but when some sensors are combined, we have a complex system of data acquisition that can be stored in the cloud and used in many applications.

Proximity Sensors

Proximity sensors detect movement, stimuli that can be used, for example, in a store where the seller can use a customer's approach to certain products and thus send offers and discount coupons directly to his smartphone. Actually, motion sensors are already well present in our lives, when we enter a room and the lamp lights, for example, it is because there is a sensor whose stimulus was our movement.

One of the greatest examples of use of this type of sensor is the shopping mall parking lots, where a lamp above the parking spaces indicates at a distance whether the space is occupied by a car or not. This application has a low cost compared to the use of cameras or employees to indicate the available positions. In addition, it is possible to discover information such as the frequency of buyers, busiest times, the convenience of the drivers in knowing how many vacancies have available in that floor and several commercial benefits, if the establishment knows how to make use of the acquired data.

Accelerometer

Our smartphones have a very curious sensor called an accelerometer, used to detect vibrations, slopes and linear acceleration. It is with this sensor that some applications count our steps and inform the distance covered of our daily walk. A very common application is to turn the screen of the cell phone: sensor detects the movement according to the sensitivity of gravity. It also serves to guide the GPS when activated, thus knowing the correct position of our direction.

Smart clocks also use the accelerometer to know the exercise movements we do and have a more accurate measurement of the calories we burn when we use this technology. In future, in gyms, this type of sensor can be used in devices that will show the necessary calorie burn for each type of user and also obtain information to make use of aerobic devices.

The use of this type of sensor has grown a lot also in the field of locomotion, where it is already being used in skateboards and hovers to detect the point of balance of the user who is performing the movement forward. The sensor detects the instability at break-even and generates movement of the wheel motors. This technology is being very innovative, facilitating the lives of many people in the locomotion and in the day to day.

Temperature Sensors

The sensors of temperature are the sensors that can help a lot in the energy efficiency and consequently in the saving of natural resources. They can help control the temperature of entire rooms and homes, making air conditioners work properly, saving energy and making the electricity bill ever cheaper.

The most commonly used types of temperature sensors are thermoresistors and thermocouples, and their differences vary according to application, accuracy and cost-effectiveness.

The thermoresistance works with the principle of thermal agitation of the metals composed by the sensor, that is, with the increase of the temperature of the environment there is the increase of the electrical resistance of the thermoresistence. This is why thermoresistance is more accurate than thermocouples.

Temperature measurement on the thermocouples occurs through the joining of two different metal conductors and joined at the end of the sensor, forming a circuit. The difference in temperature at the junction of metal, ends up generating an electromotive force, a phenomenon known as Seebeck Effect. The higher the temperature gradient at the end of the thermocouple, the higher the kinetic energy of the electrons. This will cause a difference in electric potential between the ends of the thermocouple and will cause the transformation of thermal energy into kinetic energy and thus the generation of voltage, which therefore can be measured.

Humidity Sensors

The humidity sensor can measure air and soil. It measures the relative humidity of a given area and modifies the level of charge present in the capacitor of the electric circuit board. Used mainly in the agricultural area, the soil moisture sensor is called a hygrometer and can be used in a way to revolutionize the food cultivation.

Moisture measurement is useful in plants to know when it is moistened and being nourished for its growth. The control can be done through a water pump, which will be triggered each time the sensor detects a decrease in humidity and will stop pumping every time it reaches the ideal humidity.

The agricultural industry gains a lot from the use of this sensor in the area because each type of plant can be watered according to its needs, using the specific amount of water on the land, making it extremely sustainable, achieving more efficient planting and saving water. In addition, it is obviously not possible to control the rain, but we can control the drainage of the soil.

We conclude that sensors are essential in the IoT area in order to have more intelligent and dynamic systems that help us in the day to day and also in the industry, making the manufactured products cheaper and of a higher quality than we have today. The use of sensors also facilitates access to the information that really matters, making our lives more practical and better lived.

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