

MODERN SENSOR TECHNOLOGIES

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The humanity is said to have already entered the era of sensory technologies though we may not even be aware of their presence in our lives. These range from our smartphones and smart homes to speed cameras and thermal imagers just to name a few. Sensors are all over the place and make things so much easier for us.

A sensor is defined as a device that picks up changes from the surrounding conditions (e.g., impact on the surface, or illumination, or temperature) and passes on this information over some wires or to some other system; they are widely employed in a variety of fields. For example, sensors are used on the screen of the smartphone to sense finger movement, while fitness bracelets measure the pulse, number of steps, as well as sleep phases. And all these functionalities are squeezed into a tiny single-chip device! It is because of these that we enjoy computer games, video games on our mobile phones and go around in ‘virtual’ worlds. Besides that, in phones, proximity sensors avoid any accidental touches to the screen when one is on a call. According to Statista, more than 6.6 billion people worldwide use touchscreen phones, which emphasizes the widespread adoption of touchscreen technologies [1].

In smart homes, sensors automate many tasks and make life easier. Motion sensors turn on lights when you enter a room, other sensors adjust the temperature, close and open curtains depending on the time of day. Companies like Nest are using sensors to create energy-efficient homes, reducing energy use and the impact on the environment [2]. Smart doorbells equipped with cameras and motion sensors increase security and convenience, allowing you to control your home remotely! I also know about air quality sensors, they help detect pollutants, which is very cool for a healthy life. And we can also monitor our health through wearable devices such as smartwatches, which not only track health indicators, but can also save lives – for example, by detecting irregular

heart rhythms or calling for help in case of falls or unnatural accidents [3]. In addition, biosensors are being developed to analyze sweat, saliva and even tears to assess health in real time. In the transportation sector, modern cars are equipped with sensors for parking assistance, collision detection, automatic cruise control, and autopilot. Tesla's autopilot system uses cameras and sensors to navigate safely on the road [4].

Sensor technologies play a significant role in the data collection component of automation, which ultimately feeds into an organization's IT systems. There are expectations of tremendous growth in the global sensor market. Emerging technologies, including quantum sensors that have the potential to deliver extremely precise measurements, will aid in developments related to healthcare, and environmental monitoring among others. City experts will be enabled by Artificial Intelligence and the Internet to build smart cities that manage city traffic intelligently, and manage all other aspects that can be managed intelligently. For instance, sensors embedded in intelligent traffic signals could automatically self-adjust based on real-time traffic congestion.

For IT students, this area offers enormous opportunities: from improving existing sensors to creating new ones. As sensor technology continues to evolve, its capabilities and impact will expand, impacting industries that people need, improving quality of life, and driving technological advancement. These unnoticeable devices have a profound impact on our daily lives, giving hope for limitless possibilities for our future.

References

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