APPLICATIONS OF IOT

**1.Outdoor surveillance**

When IoT CCTV cameras combined with [artificial intelligence](https://research.aimultiple.com/ai/) and [machine vision](https://research.aimultiple.com/machine-vision/), governments can automate surveillance of streets through cameras. As IoT enables connectivity of machines, they are able to record and analyse video data in real time, and they can provide police officers with insights instead of single pieces of images.

**2.Smart lighting**

Smart lighting aims to optimize energy management. Smart lighting is made up of street lighting with IoT sensors. Sensors collect data about the condition of traffic and pedestrians. With that data, street lights provide optimum lighting so that street lighting systems can save up to 80% of the energy.

**3.Electronic Road Toll Collection and Traffic Management**

Traffic engineers augmented by smart systems at a central traffic management center (TMC) can analyze data from IoT sensors then optimize timing of traffic lights throughout the day. This can help divide the traffic more evenly over roads as traffic volume fluctuates.

**4.Smart parking**

Working principle of smart parking is:

* Sensors are attached to parking lots to detect parked cars
* Measurements are periodically sent to the cloud by microcontrollers
* Mobile Apps use cloud data to identify empty parking spaces,
* Drivers check mobile apps to identify vacant parking spaces close to the location they aim to go to.

**5.Noise Monitoring**

In smart cities, sound monitoring systems can monitor noise levels and warn companies that violate limits and help manage noise levels.

**6.Structural Health Monitoring**

IoT allows remote collection of architectural data to monitor events such as vibrations and changes in material conditions, predict structural damage, and prepare action plans for structures such as bridges, buildings, stadiums, ships, airplanes, etc.

**7.Water conservation**

Sensors detect the water level in tanks and alerts when the water level is lower than the threshold. [Well™,](https://mindtribe.com/2017/03/well-a-smart-home-water-conservation-system/) a smart home water conservation system developed by [Mindtribe](https://mindtribe.com/selected-work/" \t "_blank), uses IoT sensors to monitor water usage.

**8.Smart Irrigation**

IoT sensors determine the weather condition and the soil moisture, which will help in getting the appropriate amount of water that soil needs. [Bosch](https://www.bosch.com/stories/iot-based-smart-irrigation-system/) offers an IoT solution that measures how much water the tree needs and provides that amount of water.

**9.Leakage Management**

IoT sensors can detect temperature changes, water leakage, chemical leakage, and pressure level in water tanks.

**10.Water Quality Management**

IoT sensors determine what kind of chemicals are in the water. They also identify metrics such as total dissolved solids (TDS), bacteria, chlorine, electrical conductivity, etc.

**11.Ultraviolet Radiation Monitoring**

Ultraviolet (UV) rays are electromagnetic waves that account for about [10](https://ag.tennessee.edu/solar/Pages/What%20Is%20Solar%20Energy/Sunlight.aspx)% of solar light. When overexposed, UV rays have harmful [effects](https://www.epa.gov/sunsafety/health-effects-uv-radiation) such as skin cancer, premature aging, cataracts, and immune system suppression. IoT sensors measure UV sun rays to warn people not to be exposed in certain hours.

**12.Fall Detection**

Falling into the ground and not being able to get up or request help can be a scary experience for senior citizens. IoT sensors can detect falls using geolocation data and summon help so that it reduces the time the elderly remain on the floor after a fall which could lead to lethal consequences.

**13.Near Field Communication (NFC) Payment**

NFC enables contactless payments. POS vendors include NFC support in their systems, and customers are adopting contactless payments via their smartphones.

**14.Layout Optimization**

Sensors in the store collect data like voice, image or video to better understand customer habits and preferences. Retailers can get insights to redesign the layout of their stores. The optimized layout can enhance sales.

**15.Smart Product Management**

IoT sensors enable retailers to control the rotation of products on shelves and warehouses to automate merchandising decisions. We have already written about [retail analytics use cases,](https://research.aimultiple.com/retail-analytics-use-cases/) feel free to check it out if you want to learn more.

**16.Home Intrusion Detection Systems:**

IoT based home security applications give users capabilities such as smart locks and security cameras that detect motions and send alerts to their smartphones so that they can monitor the safety conditions of their home from anywhere.

**17.Smart locks**

[Eyelock](https://www.eyelock.com/) is a security provider vendor that offers its clients an iris-based authentication solution.

**18.Motion detection**

[Manything](https://manything.com/) is another vendor in IoT based home security market. It streams homes/office videos and lets users receive alerts when it detects any activity.

**19.Platooning**

Platooning involves a group of self-driving trucks that follow a lead truck at high speed safely and efficiently. Trucks use IoT sensors so that each truck communicates with the other trucks to adapt its speed and braking accordingly.

**20.Supply Chain Control**

IoT devices have transformed supply chain management. Sensors, which are attached to storage containers or to products themselves,

* show the location of goods using GPS,
* track the speed of movement providing an accurate estimated time of arrival (ETA) for goods,
* monitor warehouse conditions such as temperature, humidity, light intensity, and other environmental factors