

Distinguish, differentiate, compare and explain what is the difference between active and passive sensors. Comparison and Differences.

Sensors can be classified as passive or active. Sensors, which sense natural radiations, either emitted or reflected from the Earth, are called passive sensors. It is also possible to produce electromagnetic radiation of a specific wavelength or band of wavelengths and illuminate a terrain on the Earth's surface. The interaction of this radiation with the target could then be studied by sensing the scattered radiation from the targets. Such sensors, which produce their own electromagnetic radiation are called active sensors.

A photographic camera, which uses only sunlight, is a passive sensor; whereas the one, which uses a flash bulb, is an active sensor. Again, sensors (active or passive) could be either imaging, like the camera, or non-imaging, like the nonscanning radiometer. Sensors are also classified on the basis of range of electromagnetic region in which they operate such as optical or microwave.

Difference between active and passive sensors

1. Active Sensor requires an external AC or DC electrical source to power the device. Passive Sensor provides its own energy or derives energy from phenomenon being studied.
2. Active sensor examples: Strain gauge, blood pressure sensor. Passive sensor example: Thermocouple.

Passive vs Active Sensors in Remote Sensing

Active sensors have its own source of light or illumination. In particular, it actively sends a wave and measures that backscatter reflected back to it.

Passive sensors measure reflected sunlight emitted from the sun. When the sun shines, passive sensors measure this energy. But more on this later.

Cameras act as both passive AND active sensors

When you take picture with the camera flash turned on, what's exactly happening here?

The camera sends its own source of light to the target and reflect back to the camera lens. This is the light that your camera captures. You can think of active remote sensing like a handheld camera with the flash turned on. But active remote sensing can be space-borne satellites orbiting the Earth or airborne on an aerial unit.

Cameras are active sensors when the photographer uses flash. It illuminates its target and measures the reflecting energy back to the camera.

Cameras are passive sensors when the photographer does not use the flash. Because the camera is not sending the source of light, it uses naturally emitted light from the sun.