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Research and write a report on how to construct a motion sensing smart home alarm with a passive infrared sensor (PIR sensor) and an Arduino microcontroller.

Infrared sensors are normally used to estimate the distance of an object and can used to detect the presence of object. It consist of IR transmitter and IR receiver the transmitter output pulses of infrared radiation while at the same time the receiver detect any reflection. If the receiver does not detect any reflection it means there is no any object at some distance in front of the sensor and if the receive detect a reflection it means there is an object at some distance. The IR sensor that we are using in this project is a sharp infrared ranger these sensor these sensors ave small linear charge coupled device (CCD) array that detect the angle at which the IR radiation return to the sensor.

PIR detects somebody's body heat as the got closer to the device they are small and they require very minimal amount of power and they are also cheap. When PIR sense motion it gives digital output PIR has three things crucial. A Fresnel lens, an infrared detector and supporting detecting circuitry an infrared ground is focused by the lens towards infrared detector .Human bodies give out infrared heat and thus heat is detected by the sensor with a detection of a person the sensor give out a 5v signal for sixty seconds period the span of detection given by the sensor is approximately 60m and it is highly sensitive.

The other component is Arduino is technically an open source prototyping platform which relies on easy to use hardware and software. It has the ability to read the input and eventually turn the input int output such as turning on a LED or publishing something online by sending instruction into micro controller a user can command the board to carry some functions this is done by the use of Arduino programming language which is based on the wiring done on board and the Arduino software or intergrated development environment which is based on processing. The Arduino was inverted at the interaction design institute and the main use of the device was for fast prototyping and it was targeting those student who lack knowledge of electronic and programming. Arduino are expensive, they are close-platform, they run windows, they have simple clear programming environment and the are open source and extensible hardware.

Conclusion

Physical property of analog signal can be converted to digital signal. A motion detector can be easily built using component that are readily available.

Recommendation

The high sensitivity of PIR can be curbed in a number of ways such as covering it with a cardboard, putting it inside a pill bottle rapped in a tissue paper. This would help reducing instances of the sensor picking on every moment and focusing itself on specific or on directional sensing. The simple circuit can be extended to do some stuffs like activating lights and a speaker.

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