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PIR Motion Sensor

**Part 1**

1.Research

a/b)PIR sensors allow you to sense motion, almost always used to detect whether a human has moved in or out of the sensors range.

PIRs are basically made of a pyro electric sensor (which you can see above as the round metal can with a rectangular crystal in the center).

They can detect levels of infrared radiation. Everything emits some low level radiation, and the hotter something is, the more radiation is emitted.

The sensor in a motion detector is actually split in two halves. The reason for that is that we are looking to detect motion (change) not average IR levels. The two halves are wired up so that they cancel each other out. If one half sees more or less IR radiation than the other, the output will swing high or low.

**Part 2**

1. List 3 Applications of your sensor.

Passive infrared sensors are the most widely used motion in home security systems. Some schools and businesses have motion sensor lights. Businesses have motion detector system with security cameras.

1. Design an application using your sensor.

Since most motion sensors stay alarmed to various situations they are designed/programmed for the heat and movement in areas they are situated in.

We could design a sensor could do many simple things for us like when you are by the garage or front door it will automatically open.

Use a motion sensor to check up on someone such as your grandma or grandpa when they need help. All they have to do is wave at the bar or objects hardware or do some type of indication in order for the system to confirm they need support.

Use motion sensors built in to robots and other computer systems to read various hand gestures and actions in order to do that function. For example for a bridge or gate control, opening your hands out wide means to have the bridge/gate open, clapping or closing your hands has the gate/bridge close.

**Our idea**: Have a motion sensor integrated to a computer mouse to allow the pc or laptop itself to automatically power on. When the user is close to or touches the mouse for at least 5 seconds the computer powers up allowing the monitor to recognize a active signal from the VGA turning it on also. Boards like Arduino with cables like jumper wires (two f-f and one f-m) can be used to make a connection with the computer to make the board become a PC power switch. A type of cable such as a jumper wire can be connected to the front panel ports titled “power switch” to get control of power over the computer. Some pcs can be switched on with USB devices such as keyboards or mouse IR-sensor and jumper, as it can sometimes be enabled through the CMOS setup.

Main Loop Code Specialist:

If the sensor detects motion for 5+ seconds then the computer turns on.

If the motion sensor detects motion for 5+ seconds then the monitor turns on.

If the motion sensor detects motion for 5+ seconds then the keyboard turns on.

If the motion sensor detects motion for less than 4 seconds than the computer won’t turn.

If the pc is powered then the pc LEDs/lights turn on

If pc is powered on then the speaker will indicate a beep.

If the monitor is powered on then the monitor LED/lights turn on

If the motion sensor detects motion out of range then the outcome will be nothing.

For each time the pc is powered on the speaker will indicate a beep.

(Turns on computer and devices) with an output beep of indication from a buzzer/speaker.

* pc
* monitor displaying results/data
* pc lights
* led lights
* screen on
* keyboard
* etc

Hold mouse for less than 4 (1-4) seconds = nothing

Code that can identify a specific variable in seconds that the motion sensor needs to operate on.

Far away from mouse = nothing

(Out of sensors range)

A code to detect whether a human has moved in or out of the sensors range.

if (val == HIGH) { // check if the input is HIGH

if (state == LOW) { // check if the input is LOW

Whenever the PIR motion sensor detects a person, it outputs a digital HIGH signal to the Arduino's digital pin. This will trigger a function called: intruder\_detect(). You can program the Arduino to do something when it detects an intruder by editing the function: intruder\_detect().

if(motionDetected == HIGH) // If motion detected

We will have to built in Buzzer or Piezo Speaker (OSSEP) that will indicate if there is motion detected from the mouse.

void setup(){

pinMode(buzzer, OUTPUT); // Set buzzer - pin 9 as an output

}

void loop(){

tone(buzzer, 1000); // Send 1KHz sound signal...

delay(1000); // ...for 1 sec

noTone(buzzer); // Stop sound...

delay(1000); // ...for 1sec

}

An Arduino command/code that identify usb device such as mouse in the loop.