Project Proposal

Team members: Abubakr, Cody, Farnoud

Date: 09/16/2014

1. Project Idea: Motion Detector Sensor Alarm (M.D.S.A)
   a. Overall System Description:
      i. This idea was inspired by movies featuring thieves attempting to steal something of value (from a museum, bank, vault, etc...). Our scenario will be as follows; we want to provide a device to guard something valuable. We first turn on the sensor and enter a pin (4 digits - TBD) to arm sensor. The alarm beeps/triggers LED's that confirm if the alarm has been set. A delay (10 seconds or so) is then set so that the user can put the motion detector somewhere in the room. After the delay, the detector is armed and ready. The alarm will trigger/beep/flash if the motion sensor is tripped. The user can then go to the sensor disarm the sensor with the pin.
      ii. Goal: Develop a device that can be activated/deactivated via a secret pin entered using a keypad and sound an alarm when the motion sensor detects movement via a speaker/buzzer.
         1. Stretch goal: Integrate an LCD monitor to display status of motion sensor
   b. HW components needed
      i. MSP430 F5529
         1. The F5529 has more digital I/O pins that will prove useful with all of the peripherals we will be connecting to it.
      ii. Keypad:
         1. Keypad will be used to enter a pin that will arm/disarm the system. The source described in a. used pins P3.0 - P3.3 to connect the rows of the keypad to the MSP430. Connecting the rows to port 3 pins, instead of port 1 pins, leaves the other port 1 pins for other interrupt sources, because the P1 pins have interrupt capability, but the P3 pins do not.
      iii. buzzer/speaker:
         1. The buzzer/speaker will serve as the alarm for the system. If the motion sensor detects activity, it will trigger the buzzer to make some type of beeping noise. The noise will only stop when the security code is provided via the keypad. A piezo speaker is a likely candidate for the alarm and would require to be connected directly to a pin via a capacitor ~0.1mF.
            b. Piezo speaker: https://www.sparkfun.com/products/7950
      iv. motion sensor:
         1. Heart of the project. The motion detector will need to make use of the 16 bit ADC of the MSP430 to do some processing. According to the
source in a., a common pyroelectric passive infrared (PIR) sensor is a potential candidate for the sensor. The source also diagrams how to connect to the integrated ADC of the MSP430F2013.


v. LED's
1. Used to inform if the Alarm is triggered, password is set, etc....
2. Maybe have one LED that can change to multiple colors (GREEN for alarm set and RED for alarm triggered)

c. System Diagram