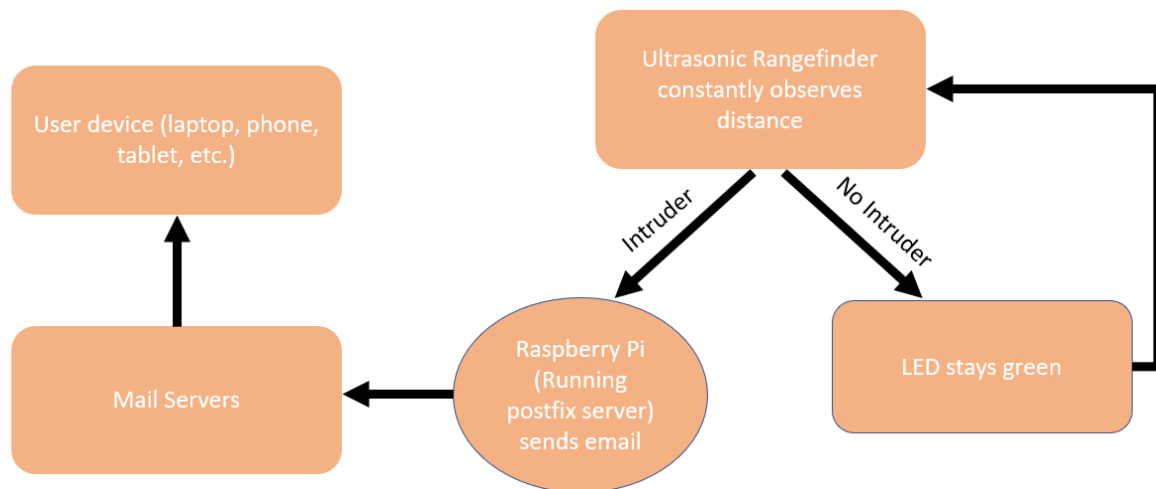


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Our project is representative of a security system which will alert the owner/security if it senses movement. We will be using a rangefinder to detect the distance between the sensor and a door. If the door opens we know the distance will change and therefore we know there is an intruder. We will set a threshold value for the sensor and if the sensor exceeds that value by a certain amount we will alert the owner/security. In our case, our alert will be using the Raspberry Pi to send an email to the owner/security team.

Our block diagram shown below



○ Briefly describes components, protocols used, key processing techniques, etc. along with important implementation/design choices.

We used a raspberry pi, rangefinder from the Grovepi kit, and the LCD. The raspberry pi was used to send an email using postfix to the user/security team, the rangefinder was the sensor we used to detect an intruder. Lastly, the LCD was used to indicate visually if there is an intruder or not.

Some protocols we used were the OS libraries from the raspberry pi, tools provided by post fix, python OS library and the GrovePi OS library.

We decided the threshold in which our code would detect an intruder was 17cm, so if the rangefinder's signals indicated it was greater than 17cm, the LCD would turn red and it would send an email. Once the email is sent and the distance is less than 17cm, the LCD resets to the color green, while the system constantly checks the distance. This distance can be changed easily depending on the setup. Our design is based on a traditional door alarm system, which includes a sensor attached to the door.

One limitation of our design is that it is only implemented for the door. If an intruder went through a window or other entrances the alarm system would not trigger. However, we could replicate and modify our system for future use on any kind of entrance of a house/building but it would not be very cost efficient and feasible. Furthermore, the system needs to be attached to a

wall or secured in place so it won't move too easily from an earthquake or someone jumping around.

Another limitation is the internet connection. If the raspberry pi is not connected to the internet or the internet in the building is down, the email message will not be sent. Furthermore, if the wifi is slow or the local servers have very high congestion, it is also possible that the email will not be sent out. When there is an intruder, every second counts, so if there is a small delay it could have huge consequences.

Some improvements we could make would be to play a loud sound as well when the door is opened and also somehow connect multiple sensors wirelessly to the raspberry pi from multiple locations in the building.