**Individual Journal**

Alotaibi Mutlaq

Caskel Stallard

Senior design project I

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The problem is how to demonstrate grandma or loved-one's was in the bed or not. This can be monitoring his/her body weight and motion. That because wandering can be dangerous and the stress of this risk weighs heavily on caregivers and family. The device will consist of two parts. First, a sensor system that is located under the patient bed and throughout the house to collect and analyze data with an Arduino microcontroller. Second, an alarm/LED that is designed to go off when the system indicates that grandma is doing something “abnormal”. I was research about data configuration management plan and software development model in a project planning paper. I continue research about how we develop the project and we discussed about the diagram and how to connect the sensors and what we need to power it and where we can use the IR sensors on the room door. Also, we discussed about the coding for the Arduino to connect it wifi and how to send messages to the caregivers or family who’s add his or her number to the system.

**Power supply**

The Arduino Uno board can be powered via the USB connection or with an external power supply. The power source is selected automatically.

External (non-USB) power can come either from an AC-to-DC adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the GND and Vin pin headers of the POWER connector.

The board can operate on an external supply from 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may become unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts.

The power pins are as follows:

* Vin. The input voltage to the Arduino board when it's using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.
* 5V. This pin outputs a regulated 5V from the regulator on the board. The board can be supplied with power either from the DC power jack (7 - 12V), the USB connector (5V), or the VIN pin of the board (7-12V).
* 3V3. A 3.3-volt supply generated by the on-board regulator. Maximum current draw is 50 mA.
* GND. Ground pins.
* IOREF. This pin on the Arduino board provides the voltage reference with which the microcontroller operates. A properly configured shield can read the IOREF pin voltage and select the appropriate power source or enable voltage translators on the outputs to work with the 5V or 3.3V.

**Tasks plan**

The tasks plan for each member as follow:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Strain Ga. (Phuong)** | **IR (Abdul)** | **Build (Khanh)** | **Test (Mutlaq)** | **WiFi (Marshall)** | **Integration** |
| Calibrate | Prox. Sensor | 3D model | Give parameters of the project | Setup | Make the story work |
| Weight-Value (The breakdown weight it can handle) | Daylight/Night | Hooking everything up | Environmental Factors (different lighting, door frames, bed weights) | Protocol | Keypad/finger sensor |
| Test | LED/Fluorescent | Battery(Arduino, Sensors) |  | peer to peer | TA at Nov/20 |
| Zeroize | code into arduino | Enclosure |  | dhcp |  |
| Code into Arduino |  |  |  |  |  |
| arduino uno with HTTPS | arduino uno with HTTP |  |  |  |  |
|  |  |  |  |  |  |

My task will be focus on how to test the project by give parameters of the project and environmental factors (different lighting, door frames, bed weights).

We worked this week with our project and we build it and connected the wight sensors and Arduino after we upload the code on it. Then we calibrated but it didn’t work. We plane to fix the code again and do the test again.

Interview (1): Sandy from Comfort Care:

Comfort Care is an assisted living facility for dementia patients in Wichita, KS. We informed her that our project is aiming to help caregivers of dementia patients. We asked her how often the patients wander around and how far could they wander? She said they can wander around the inside of the building, but they must be accompanied by a caretaker outside the building. Then we asked what kinds of sensors and systems that facility is using and how do they respond? Sandy said they have a bedtime alarm system in place that will sound an alarm when it's time for them to go to bed.

Interview (2): Md Rakib Ur Rahman:

              Rakib is an PhD electrical engineer student and a TA for the course. We set up a meeting with him to ask about some technical issues the project may have. We asked him about various problems regarding the project’s functionality. We had a question for him about our battery powered board. After we did my calculation for the power consumption, we thought that as the battery is drained, the internal regulator of the Arduino won’t be able to keep up. Rakib advised us that we should do some testing and get data voltage drop and the internal load of the assembly first before deciding on if we want an extra regulator.

Interview (3): Michelle from Brookdale:

Brookdale Senior Living owns and operates senior living communities and retirement communities across the United States. We were able to talk with Michelle for the interview. Michelle is currently working as a nurse for a Brookdale facility in Wichita. We informed her about our project which aims to help caregivers of dementia patients. She said that the sensor system would cause a restraint to the staff and that they cannot use such a sensor system because it would go against their company policy. Instead, they use call lights, fall mats, and frequent checks (10 – 20 minutes).