

Periodic measurement of nighttime weight change while asleep

Week: September 30- October 5

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Problem Statement

We would like to be able to measure this weight change accurately on people who are in hospital beds, and be able to view and record the weight changes over various intervals through the night (such as weighing a person who agrees to lay in bed all night at intervals of every 10-15 minutes). This is important from a research perspective on numerous potential variables that may affect this weight change, such as medications as well as sleep stage changes. We would also use this to potentially track and eventually predict those at higher risk of developing obesity, correlate with body fat measurements, activity, and assess for metabolic changes when we do things to improve/correct sleep problems. There is popular concern in the most recent sleep literature about various sleep stages, insomnia, and their impact on obesity. This scale would likely have to support a hospital bed, which sits on 4 legs, and read at an accuracy ideally around 0.02- 0.05 lbs (many scales on the market record to such accuracy, the more accurate the better). I'm not sure how the zeroed weight of the bed would affect this. Ideally it would be a device we could move to a different bed without too much difficulty (such as in 1-2 hours time), without too complex recalibration.

Last Week's Goals

- Team meeting to discuss potential designs and pick apart scale
- Meet with Advisor
- Continue work on design notebook
- Continue research on scales and load cells

Accomplishments

- We met at ECB on Monday night to discuss potential designs and also to take apart the digital scale we purchased. Upon opening up the scale we saw that it contained strain gauge load cells that interfaced with a circuit board to display the weight value. This gave us another potential idea and also gave us a prototype to potentially base our design on (load cell to circuit board to display).
- We will be meeting with Dr. Juergens on Thursday evening to make sure he approves of our ideas and is alright with us beginning to purchase parts. We also want to run over our PDS with him and try to get some more specific values for certain aspects of the design.
- We met with Professor Block during class time and Friday and also met the graduate student who we can contact for additional help. Professor Block supported our idea of using a load cell and amplifier.

This Week's Goals

- Begin purchasing parts and building a prototype
- Begin Midsemester Report and presentation
- Meet with Professor Block on Friday to discuss our ideas
- Revise PDS, put in additions as needed.

Difficulties

- The price of a precise enough load cell continues to be a problem
- The circuitry may be very intricate and require help from someone who is knowledgeable with circuits.
- A prototype may have to be built that does not have the accuracy desired by Dr. Juergens

Successes

- We are moving nearing to building an actual prototype
- Purchasing a load cell this early will give us plenty of time to deal with the computer programming and circuitry aspect of the design

Weekly Reports															
Notebooks															
MEETINGS															
Team Meetings															
Client Meetings															
Advisor Meetings															
BSAC Meetings															
OTHER															
Web Page															
Special Lectures															

Expenses to Date: \$0.00