

Team Spirometer Progress Report July 30, 2009 – August 5, 2009

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Goals for the past week

- Continue debugging of I²C code
- Develop and build prototype hardware from iLite to PIC
- Continue SQL, Ruby and Rails development
- Improve capillary manufacturing methods
- Continue PCB development with Amit

Accomplishments

- Manufacturing – Hematocrit tubing and double-barrel coffee straws
 - Cutting with ice in hematocrit tubes - best results thus far with hematocrit tubing!
 - Still a decent amount of debris in the tubes, probably from the coarse saw blade
 - This can be avoided in future by using saw belonging to Amit's contact
 - However, hematocrit tubing may not work anyway due to low porosity (see *Hematocrit Tube Fleisch Evaluation* report sent on 8/4 for full discussion)
 - Built and tested 3 double-barrel coffee straw spirometers
 - Test results from first 2 models found in reports sent on 8/4 and attached to this e-mail
 - One more report still being composed, should be done by Friday
- SQL and Ruby on Rails
 - Developed the code necessary to obtain and view data, as well as Google chart depiction of Volume-Time and Flow-Volume curves
 - Program is basic, currently can only get one set of data per execution
 - Modifications will be made in future to loop code and acquire all 100 results
 - Additional code will be written to generate CSV text file from data
- Algorithm development with NHANES data
 - David's NHANES expert still is not replying for unknown reasons
 - Have stopped attempting to identify NHANES processing algorithms due to their age (published in 1980s) and the multiple other data sources (SQL data set, ISO documentation, etc.) that are available for validating our algorithms.

- PIC Programming – I²C
 - Continued debugging and adapting Isaac’s code
 - Made progress, but are stuck at unknown syntax errors
 - Hope to show a contact of Amit’s the program to get assistance in debugging
- PCB Hardware layout
 - Amit made progress on the I²C portion of the board
 - Should be able to connect iLite development board to PIC development board for data acquisition quite soon

Goals for the upcoming week

- Quantify relationship between capillary length and resistance
 - Double-barrel coffee straws provide excellent test material
 - Will compare our spirometer’s results with commercial spirometer from 310 lab
- Continue debugging of I²C code
 - Once debugged, we could load it on to the PIC
 - Amit will finish iLite -> PIC hardware soon for testing
- Continue SQL, Ruby on Rails development
 - Program works, now needs to be optimized
- Begin outlining final report
 - Can also serve to highlight areas that may have “slipped through the cracks”
- Continue hardware development with Amit

Difficulties

- The hematocrit tubing that looked so promising will most likely not be a viable option for our spirometer due to their thick walls.
- Double-barrel coffee straws are an alternative, but they are irregular in shape and hard to analyze

Areas we would like assistance/feedback

- Kronos reminder – we’ll e-mail you when we approve our hours