

Open-source, low-cost, web-guided spirometer

- Team:** Jeremy Glynn – Team Leader
Jeremy Schaefer– Communications
Andrew Dias – BWIG
Andrew Bremer – BSAC
- Week:** January 23- January 29, 2009
- Client:** David Van Sickle, PhD
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Problem Statement

Spirometers are used to diagnose many pulmonary diseases including chronic respiratory diseases that affect approximately 300 million people. Many of these people do not have access to a spirometer because current models are expensive and operation requires the presence of a trained technician. The purpose of this project is to develop a low-cost spirometer capable of measuring lung flows and volumes that can be used by patients without the aid of a trained technician. The project includes the physical design of the spirometer, software development, and designing a universal interface. We envision a first generation device that connects to a computer via a USB port and guides and coaches patients through the testing using digital audiovisual clips. As the procedures are performed, a combination of client and server software will graphically display flow and volume data, monitor and evaluate the quality of the maneuver, and instruct the subject when their performance needs to be corrected. The software should also carry out some rudimentary analysis and interpretation using algorithms that are freely available from the American Thoracic Society. Overall, we hope to develop a tool that would be widely affordable and would standardize pulmonary function measurements by delivering the same instruction and coaching across sites for the first time.

Last Week's Goals

- Assign team roles
- Exchange contact information
- Conduct preliminary research on current spirometer technology
- Set up meeting with client and Amit Nimunkar
- Attend supplemental lab equipment training workshop on 1/29

Accomplishments

- Held first meeting on 1/28 with client and Amit
- Began preliminary spirometer research and brainstorming
- Attended supplemental lab equipment training workshop on 1/29
- Started developing PDS
- Scheduled to meet with Amit on 1/30 for lab orientation and design discussion

This Week's Goals

- Get keycard access to 2029 ECB
- Continue developing PDS, send preliminary version to client and Amit
- Establish website
- Perform/review BME 310 Spirometry lab
- Begin to break project into components for division of tasks
- Target areas to modify spirometers for cost efficiency

Difficulties

- The career fair next week will limit convenient times for group work.

Team Effort

Team Member	Accomplishments	Time (Hrs)	Running Total (Hrs)
Jeremy Glynn	Class time, individual research, client meeting, lab training	3.0	3
Andrew Bremer	Class time, individual research, client meeting, BSAC, lab training	3.0	3
Jeremy Schaefer	Class time, individual research, client meeting, lab training	3.0	3
Andrew Dias	Class time, individual research, client meeting	3.0	3

Project Schedule

PROJECT TASKS AND PROGRESS	Jan.	February				March				April				May		
	29	5	12	19	26	5	12	19	26	2	9	16	23	30	7	14
WORK																
Brainstorming																
Research																
Designing Prototype																
Selecting Prototype																
Obtaining Materials																
Building Prototype																
Testing Prototype																
Modifications																
DELIVERABLES																
PDS																
Mid-Sem. Report																
Mid-Sem. Presentation																
Final Report																
Final Presentation																
Weekly Reports																
Notebooks																
MEETINGS																
Team Meetings																
Client Meetings																
Advisor Meetings																
BSAC Meetings																
OTHER																
Web Page																
Special Lectures																

Expenses to Date:

- No expenses to report at this time.