

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

- Team:** Jeremy Glynn – Team Leader
Jeremy Schaefer– Communications
Andrew Dias – BWIG
Andrew Bremer – BSAC
- Week:** May 1 – May 7, 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

- Deliver poster presentation
- Develop final design report
- Establish firm plans for design future with client
- Prepare for poster presentation

Accomplishments

- Delivered Poster Presentation
- Met with client on 5/6 to discuss future direction
- Developed Semester report

This Week's Goals

- Hand-in end of semester deliverables
- Create questions list for Vitalograph representative
- Specify testing equipment for summer use
- Look into various multi-platform programming languages

Difficulties

- Final exams during this week have made it difficult to hold team meetings.

Team Effort

Team Member	Accomplishments	Time (Hrs)	Running Total (Hrs)
Jeremy Glynn	Poster presentation, Final Report	6	62
Andrew Bremer	Poster presentation, Final Report	6	62
Jeremy Schaefer	Poster presentation, Final Report	6	62
Andrew Dias	Poster presentation, Final Report, website	6	62

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	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange								
Research	Cyan	Cyan	Cyan	Cyan	Cyan	Cyan	Cyan	Cyan								
Designing Prototype			Yellow	Yellow	Yellow	Yellow	Yellow									
Selecting Prototype																
Obtaining Materials				Green	Green	Green			Green	Green	Green	Green	Green			
Building Prototype									Red	Red	Red	Red	Red			
Testing Prototype									Orange				Orange	Orange	Orange	
Modifications									Olive				Olive	Olive	Olive	
DELIVERABLES																
PDS	Dark Red	Dark Red	Dark Red	Dark Red	Dark Red	Dark Red								Dark Red	Dark Red	
Mid-Sem. Report							Yellow									
Mid-Sem. Presentation				Black	Black	Black										
Final Report															Light Blue	
Final Presentation														Red		
Weekly Reports	Green	Green	Green	Green	Green	Green		Green	Green	Green	Green	Green	Green	Green	Green	Green
Notebooks	Blue	Blue	Blue	Blue	Blue	Blue		Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue
MEETINGS																
Team Meetings	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Client Meetings	Purple	Purple	Purple	Purple	Purple	Purple		Purple	Purple	Purple		Purple		Purple	Purple	Purple
Advisor Meetings	Grey	Grey	Grey	Grey	Grey	Grey		Grey	Grey			Grey		Grey		Grey
BSAC Meetings	Red	Red	Red	Red	Red	Red		Red	Red	Red		Red	Red			
OTHER																
Web Page		Pink		Pink		Pink		Pink				Pink		Pink	Pink	Pink
Special Lectures									Teal							

Expenses to Date:

- STMicroelectronics KEIL STARTER KIT \$189.70
- Pressure sensor order (Mar 1, 2009) – Freescale Semiconductor - \$63.03
- Pressure sensor order (Mar 30, 2009) – Mouser Electronics - \$40.83
- PVC materials for spirometer and test apparatus construction - \$3.50
- Skywatch Explorer II Anemometer - \$65.00