

Design of Weight Distribution Monitoring System

Client: Dr. Willis Tompkins, Ms. Carol Rohl

Advisor: Dr. Thomas Yen

Team: Xiyu (Steve) Wang (xwang332@wisc.edu) – Team Leader

Dalton Hess (dhess2@wisc.edu) - Communicator

Kiersten Haffey (haffey@wisc.edu) - BSAC

Andrew Vamos (vamos@wisc.edu) - BWIG

Jacob Hindt (jhindt@wisc.edu) - BPAG

Date: 9/8/13 – 9/14/13

Problem Statement

Stroke is a major issue in the United States with more than 800,000 yearly occurrences and 133,000 deaths every year. Many survivors of heart strokes experience brain damage that can leave their body permanently injured. A hemiplegic individual who suffered a stroke five years ago lost all senses on her left side of the body. She is ambulatory but suffers from improper walking and standing positions due to her left side. We are working on a portable device that will allow her to practice how it feels to stand with proper weight distributions. We hope that by practicing with our device, our client will be able to improve her walking and improve her overall quality of life.

Last Week's Goals

- n/a

Summary of Team Role Accomplishments

- The team met for the first time on Friday, September 6th and designated team roles

Summary of Design Accomplishments

- The team met with our client (Dr. Tompkins) and discussed about the previous year's project as well as Ms. Carol Rohl's criticism and areas of improvements for the device
- Team had an initial brainstorming session where we explored various potential materials

This Week's Goals/Individual Goals

- The team will research potential materials and their feasibility for our project including Arduino microprocessor, Wii Fit Balance Board, bathroom scales.

Final Poster															
Meeting															
Client	X														
Team	X	X													

Expenses:

Date:	Item:	Cost:	Comments:

Design of Weight Distribution Monitoring System

Client: Dr. Willis Tompkins, Ms. Carol Rohl

Advisor: Dr. Thomas Yen

Team: Xiyu (Steve) Wang (xwang332@wisc.edu) – Team Leader

Dalton Hess (dhess2@wisc.edu) - Communicator

Kiersten Haffey (haffey@wisc.edu) - BSAC Andrew

Vamos (vamos@wisc.edu) - BWIG

Jacob Hindt (jhindt@wisc.edu) - BPAG

Date: 9/15/13 – 9/21/13

Problem Statement

Stroke is a major issue in the United States with more than 800,000 yearly occurrences and 133,000 deaths every year. Many survivors of heart strokes experience brain damage that can leave their body permanently injured. A hemiplegic individual who suffered a stroke five years ago lost all senses on her left side of the body. She is ambulatory but suffers from improper walking and standing positions due to her left side. We are working on a portable device that will allow her to practice how it feels to stand with proper weight distributions. We hope that by practicing with our device, our client will be able to improve her walking and improve her overall quality of life.

Last Week's Goals

- The team will research potential materials and their feasibility for our project including Arduino microprocessor, Wii Fit Balance Board, bathroom scales.
- The team will also research on the biological background of heart strokes as well as the mechanical background of how weight distribution is calculated through piezoelectric sensors.

Summary of Team Role Accomplishments

- Jacob met with Russell Little, a member of the previous year's design team and learned more about what went well and not well
- The team got together and completed a preliminary PDS based off the current information available

- More research was conducted regarding the biological background of strokes as well as the mechanical background of how force distribution measurements are made

Summary of Design Accomplishments

- n/a

This Week's Goals/Individual Goals

- The team will continue doing research on potential materials such as bathroom scales that have load cells and potential lighting projection systems (laser, LED) as well as vibration motors for possible applications
- The team will also research whether the issue at hand is weight distribution or a center of gravity based
- The team will try to contact Ms. Rohl as well as Dr. Tompkins to figure out when to Skype with Ms. Rohl

Project Difficulties

- Dalton has tried calling Ms. Rohl multiple times but she has not responded. We are unable to coordinate a time to Skype with her and ask her more about her issue.

Activities:

Date	Person(s)	Task	Time (Hours)	Weekly Total	Semester Totals
9.6.2013	Andrew	Client Meeting	1	2	5
9.8.2013		Group Meeting	1		
9.12.2013		Literature Research Group	1		
9.15.2013		Meeting	1		
9.19.2013		Literature Research	1		
9.6.2013	Dalton	Client Meeting	1	2	5
9.8.2013		Group Meeting	1		
9.8.2013		Literature Research Group	1		
9.15.2013		Meeting	1		
9.16.2013		Literature Research	1		
9.6.2013	Jacob	Client Meeting	1	2	6.5
9.8.2013		Group Meeting	1		
9.9.2013		Literature Research	1.5		
9.9.2013		Previous Member Meeting	1		
9.15.2013		Group Meeting	1		
9.18.2013		Literature Research	1		

9.6.2013	Kiersten	Client Meeting	1	2	5
9.8.2013		Group Meeting	1		
9.9.2013		Literature Research Group	1		
9.15.2013		Meeting	1		
9.16.2013		Literature Research	1		
9.6.2013	Steve	Client Meeting	1	2	6
9.8.2013		Group Meeting	1		
9.9.2013		Previous Member Meeting	1		
9.11.13		Literature Research	1		
9.15.2013		Group Meeting PDS	1		
9.17.2013			1		

Timeline (Tentative):

Task	September				October				November				December	
	6	1	2	2	4	1	1	2	1	8	1	2	2	7
Project R&D														
Lit. Research		X	X											
Manufacturing														
Cost Estimation														
Prototyping														
Deliverables														
Progress Reports		X	X											
Midsemester														
Final Poster														
Meeting														
Client	X													
Team	X	X	X											

Expenses:

Date:	Item:	Cost:	Comments:

Design of Weight Distribution Monitoring System

Client: Dr. Willis Tompkins, Ms. Carol Rohl

Advisor: Dr. Thomas Yen

Team: Xiyu (Steve) Wang (xwang332@wisc.edu) – Team Leader

Dalton Hess (dhess2@wisc.edu) - Communicator

Kiersten Haffey (haffey@wisc.edu) - BSAC

Andrew Vamos (vamos@wisc.edu) - BWIG

Jacob Hindt (jhindt@wisc.edu) - BPAG

Date: 9/22/13 – 9/28/13

Problem Statement

Stroke is a major issue in the United States with more than 800,000 yearly occurrences and 133,000 deaths every year. Many survivors of heart strokes experience brain damage that can leave their body permanently injured. A hemiplegic individual who suffered a stroke five years ago lost all senses on her left side of the body. She is ambulatory but suffers from improper walking and standing positions due to her left side. We are working on a portable device that will allow her to practice how it feels to stand with proper weight distributions. We hope that by practicing with our device, our client will be able to improve her walking and improve her overall quality of life.

Last Week's Goals

- The team will continue doing research on potential materials such as bathroom scales that have load cells and potential lighting projection systems (laser, LED) as well as vibration motors for possible applications
- The team will also research whether the issue at hand is weight distribution or a center of gravity based
- The team will try to contact Ms. Rohl as well as Dr. Tompkins to figure out when to Skype with Ms. Rohl

Summary of Team Role Accomplishments

- Dalton was finally able to get in contact with Ms. Rohl and arranged a Skype session
- Team Skyped Ms. Rohl on Tuesday and was able to receive good feedback on the initial design ideas as well as more information regarding her issue

Summary of Design Accomplishments

- Ms. Rohl preferred the visual display so we will keep that in mind as we go over the design matrix

This Week's Goals/Individual Goals

- Team will start working on the midsemester report and presentation
- Team will wrap up research on strokes and weight distribution but continue on materials

Project Difficulties

- Dalton has tried calling Ms. Rohl multiple times but she has not responded. We are unable to coordinate a time to Skype with her and ask her more about her issue.

Activities:

Date	Person(s)	Task	Time (Hours)	Weekly Total	Semester Totals
9.6.2013	Andrew	Client Meeting	1	1	6
9.8.2013		Group Meeting	1		
9.12.2013		Literature Research	1		
9.15.2013		Group Meeting	1		
9.19.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.6.2013	Dalton	Client Meeting	1	1	6
9.8.2013		Group Meeting	1		
9.8.2013		Literature Research	1		
9.15.2013		Group Meeting	1		
9.16.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.6.2013	Jacob	Client Meeting	1	2	6.5
9.8.2013		Group Meeting	1		
9.9.2013		Literature Research	1.5		
9.9.2013		Previous Member Meeting	1		
9.15.2013		Group Meeting	1		
9.18.2013		Literature Research	1		
9.6.2013	Kiersten	Client Meeting	1	1	6
9.8.2013		Group Meeting	1		
9.9.2013		Literature Research	1		
9.15.2013		Group Meeting	1		
9.16.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.6.2013	Steve	Client Meeting	1	1	7
9.8.2013		Group Meeting	1		
9.9.2013		Previous Member Meeting	1		
9.11.13		Literature Research	1		
9.15.2013		Group Meeting	1		
9.17.2013		PDS	1		
9.24.2013		Skype Session	1		

Timeline (Tentative):

Task	September				October				November				December	
	6 3	1 0	2 7	2 7	4	1 1	1 8	2 5	1	8	1 5	2 2	2 9	7
Project R&D				X										
Lit. Research	X	X	X											
Manufacturing														
Cost Estimation														
Prototyping														
Deliverables														
Progress Reports		X	X	X										
Midsemester														
Final Poster														
Meeting														
Client	X			X										
Team	X	X	X	X										

Expenses:

Date:	Item:	Cost:	Comments:

Design of Weight Distribution Monitoring System

Client: Dr. Willis Tompkins, Ms. Carol Rohl

Advisor: Dr. Thomas Yen

Team: Xiyu (Steve) Wang (xwang332@wisc.edu) – Team Leader

Dalton Hess (dhess2@wisc.edu) - Communicator

Kiersten Haffey (haffey@wisc.edu) - BSAC

Andrew Vamos (vamos@wisc.edu) - BWIG

Jacob Hindt (jhindt@wisc.edu) - BPAG

Date: 9/29/13 – 10/5/13

Problem Statement

Stroke is a major issue in the United States with more than 800,000 yearly occurrences and 133,000 deaths every year. Many survivors of heart strokes experience brain damage that can leave their body permanently injured. A hemiplegic individual who suffered a stroke five years ago lost all senses on her left side of the body. She is ambulatory but suffers from improper walking and standing positions due to her left side. We are working on a portable device that will allow her to practice how it feels to stand with proper weight distributions. We hope that by practicing with our device, our client will be able to improve her walking and improve her overall quality of life.

Last Week's Goals

- Team will start working on the midsemester report and presentation
- Team will wrap up research on strokes and weight distribution but continue on materials

Summary of Team Role Accomplishments

- Team was able to get together and work on SolidWorks model for our preliminary design
- Team also divided up sections of the PowerPoint to complete for Friday's presentation

Summary of Design Accomplishments

- n/a

This Week's Goals/Individual Goals

- Team will look into potential materials to buy for the light project weight distribution board

Project Difficulties

- Dalton has tried calling Ms. Rohl multiple times but she has not responded. We are unable to coordinate a time to Skype with her and ask her more about her issue.

Activities:

Date	Person(s)	Task	Time (Hours)	Weekly Total	Semester Totals
9.6.2013	Andrew	Client Meeting	1	6	12
9.8.2013		Group Meeting	1		
9.12.2013		Literature Research	1		
9.15.2013		Group Meeting	1		
9.19.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.2.2013		SolidWorks Design	2		
10.3.2013		Presentation Practice	3		
9.6.2013	Dalton	Client Meeting	1	6	12
9.8.2013		Group Meeting	1		
9.8.2013		Literature Research	1		
9.15.2013		Group Meeting	1		
9.16.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.2.2013		Solidworks Design	2		
10.3.2013		Presentation Practice	3		
9.6.2013	Jacob	Client Meeting	1	6	12.5
9.8.2013		Group Meeting	1		
9.9.2013		Literature Research	1.5		
9.9.2013		Previous Member Meeting	1		
9.15.2013		Group Meeting	1		
9.18.2013		Literature Research	1		
9.29.2013		Group Meeting	1		
10.2.2013		Solidworks Design	2		
10.3.2013		Presentation Practice	3		
9.6.2013	Kiersten	Client Meeting	1	4	10
9.8.2013		Group Meeting	1		
9.9.2013		Literature Research	1		
9.15.2013		Group Meeting	1		
9.16.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.3.2013		Presentation Practice	3		
9.6.2013		Steve	Client Meeting		
9.8.2013	Group Meeting		1		
9.9.2013	Previous Member Meeting		1		
9.11.13	Literature Research		1		

9.15.2013		Group Meeting	1		
9.17.2013		PDS	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.2.2013		SolidWorks Design	1		
10.3.2013		Presentation Practice	3		

Timeline (Tentative):

Task	September				October				November				December	
	6	1	2	2	4	1	1	2	1	8	1	2	2	7
Project R&D														
Lit. Research	X	X	X	X	X									
Manufacturing														
Cost Estimation				X	X									
Prototyping														
Deliverables														
Progress Reports	X	X	X	X	X									
Midsemester					X									
Final Poster														
Meeting														
Client	X			X										
Team	X	X	X	X	X									

Expenses:

Date:	Item:	Cost:	Comments:

Design of Weight Distribution Monitoring System

Client: Dr. Willis Tompkins, Ms. Carol Rohl

Advisor: Dr. Thomas Yen

Team: Xiyu (Steve) Wang (xwang332@wisc.edu) – Team Leader

Dalton Hess (dhess2@wisc.edu) - Communicator

Kiersten Haffey (haffey@wisc.edu) - BSAC

Andrew Vamos (vamos@wisc.edu) - BWIG

Jacob Hindt (jhindt@wisc.edu) - BPAG

Date: 10/14/2013 – 10/21/13

Problem Statement

Stroke is a major issue in the United States with more than 800,000 yearly occurrences and 133,000 deaths every year. Many survivors of heart strokes experience brain damage that can leave their body permanently injured. A hemiplegic individual who suffered a stroke five years ago lost all senses on her left side of the body. She is ambulatory but suffers from improper walking and standing positions due to her left side. We are working on a portable device that will allow her to practice how it feels to stand with proper weight distributions. We hope that by practicing with our device, our client will be able to improve her walking and improve her overall quality of life.

Last Week's Goals

- Team will look further into integrating load sensors with microcontroller
- Team will start looking at possible scales that can be disassembled
- Team will look at possible lasers
- Team will research more on how to integrate everything into a device

Summary of Team Role Accomplishments

- Team

Summary of Design Accomplishments

- Team met together to disassemble the bathroom scale

This Week's Goals/Individual Goals

- Team will look further into integrating load sensors with microcontroller
- Team will start looking at possible scales that can be disassembled
- Team will look at possible lasers
- Team will research more on how to integrate everything into a device

Project Difficulties

- Dr. Tompkins ordered some load sensors but they are currently out of order and not expected to be in stock until October 16th

Activities:

Date	Person(s)	Task	Time (Hours)	Weekly Total	Semester Totals
9.6.2013	Andrew	Client Meeting	1	2	18
9.8.2013		Group Meeting	1		
9.12.2013		Literature Research	1		
9.15.2013		Group Meeting	1		
9.19.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.2.2013		SolidWorks Design	2		
10.3.2013		Presentation Practice	3		
10.8.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
9.6.2013	Dalton	Client Meeting	1	2	18
9.8.2013		Group Meeting	1		
9.8.2013		Literature Research	1		
9.15.2013		Group Meeting	1		
9.16.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.2.2013		Solidworks Design	2		
10.3.2013		Presentation Practice	3		
10.3.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
9.6.2013	Jacob	Client Meeting	1	2	18.5
9.8.2013		Group Meeting	1		
9.9.2013		Literature Research	1.5		
9.9.2013		Previous Member Meeting	1		
9.15.2013		Group Meeting	1		
9.18.2013		Literature Research	1		
9.29.2013		Group Meeting	1		
10.2.2013		Solidworks Design	2		
10.3.2013		Presentation Practice	3		
10.8.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
9.6.2013	Kiersten	Client Meeting	1	2	16
9.8.2013		Group Meeting	1		
9.9.2013		Literature Research	1		
9.15.2013		Group Meeting	1		
9.16.2013		Literature Research	1		
9.24.2013		Skype Session	1		

9.29.2013		Group Meeting	1		
10.3.2013		Presentation Practice	3		
10.8.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
9.6.2013	Steve	Client Meeting	1	2	18
9.8.2013		Group Meeting	1		
9.9.2013		Previous Member Meeting	1		
9.11.13		Literature Research	1		
9.15.2013		Group Meeting	1		
9.17.2013		PDS	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.2.2013		SolidWorks Design	1		
10.3.2013		Presentation Practice	3		
10.8.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		

Timeline (Tentative):

Task	September				October				November				December	
	6	1	2	2	4	1	1	2	1	8	1	2	2	7
	3	0	7		1	8	5			5	2	9		
Project R&D														
Lit. Research	X	X	X	X	X	X								
Manufacturing														
Cost Estimation				X	X	X								
Prototyping														
Deliverables														
Progress Reports	X	X	X	X	X									
Midsemester					X									
Final Poster														
Meeting														
Client	X			X		X								
Team	X	X	X	X	X	X								

Expenses:

Date:	Item:	Cost:	Comments:
10/8/2013	Load sensors	\$9.95 ea	Backordered; will not arrive until after 10/16/2013

Design of Weight Distribution Monitoring System

Client: Dr. Willis Tompkins, Ms. Carol Rohl

Advisor: Dr. Thomas Yen

Team: Xiyu (Steve) Wang (xwang332@wisc.edu) – Team Leader

Dalton Hess (dhess2@wisc.edu) - Communicator

Kiersten Haffey (haffey@wisc.edu) - BSAC

Andrew Vamos (vamos@wisc.edu) - BWIG

Jacob Hindt (jhindt@wisc.edu) - BPAG

Date: 10/14/2013 – 10/21/13

Problem Statement

Stroke is a major issue in the United States with more than 800,000 yearly occurrences and 133,000 deaths every year. Many survivors of heart strokes experience brain damage that can leave their body permanently injured. A hemiplegic individual who suffered a stroke five years ago lost all senses on her left side of the body. She is ambulatory but suffers from improper walking and standing positions due to her left side. We are working on a portable device that will allow her to practice how it feels to stand with proper weight distributions. We hope that by practicing with our device, our client will be able to improve her walking and improve her overall quality of life.

Last Week's Goals

- Team will look further into integrating load sensors with microcontroller
- Team will start looking at possible scales that can be disassembled
- Team will look at possible lasers
- Team will research more on how to integrate everything into a device

Summary of Team Role Accomplishments

- Team analyzed the circuitry of the microprocessor and tried to determine the functions of each wire.

Summary of Design Accomplishments

- Team met together to disassemble the bathroom scale
- Team was able to isolate the load cells as well as the wires that come out of it

This Week's Goals/Individual Goals

- Team will try to get access to the instrumentation room to start testing out the functions of the circuits
- Team will start looking at the various components of a circuit in order to do further testing (batteries, switch, mechanism)

Project Difficulties

- The microcontroller that is in the bathroom scale is not something that we can find the data board of. Therefore we are having difficulties in assessing which wire does what function, which would be better done if we have access to the instrumentation room and its various equipment.

Activities:

Date	Person(s)	Task	Time (Hours)	Weekly Total	Semester Totals
9.6.2013	Andrew	Client Meeting	1	2	18
9.8.2013		Group Meeting	1		
9.12.2013		Literature Research	1		
9.15.2013		Group Meeting	1		
9.19.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.2.2013		SolidWorks Design	2		
10.3.2013		Presentation Practice	3		
10.8.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
9.6.2013	Dalton	Client Meeting	1	2	18
9.8.2013		Group Meeting	1		
9.8.2013		Literature Research	1		
9.15.2013		Group Meeting	1		
9.16.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.2.2013		Solidworks Design	2		
10.3.2013		Presentation Practice	3		
10.3.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
9.6.2013	Jacob	Client Meeting	1	2	18.5
9.8.2013		Group Meeting	1		
9.9.2013		Literature Research	1.5		
9.9.2013		Previous Member Meeting	1		
9.15.2013		Group Meeting	1		
9.18.2013		Literature Research	1		
9.29.2013		Group Meeting	1		
10.2.2013		Solidworks Design	2		
10.3.2013		Presentation Practice	3		
10.8.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
9.6.2013	Kiersten	Client Meeting	1	2	16
9.8.2013		Group Meeting	1		

9.9.2013		Literature Research	1		
9.15.2013		Group Meeting	1		
9.16.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.3.2013		Presentation Practice	3		
10.8.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
9.6.2013	Steve	Client Meeting	1	2	18
9.8.2013		Group Meeting	1		
9.9.2013		Previous Member Meeting	1		
9.11.13		Literature Research	1		
9.15.2013		Group Meeting	1		
9.17.2013		PDS	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.2.2013		SolidWorks Design	1		
10.3.2013		Presentation Practice	3		
10.8.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		

Timeline (Tentative):

Task	September				October				November				December	
	6	1	2	2	4	1	1	2	1	8	1	2	2	7
Project R&D														
Lit. Research	X	X	X	X	X	X								
Manufacturing														
Cost Estimation				X	X	X	X							
Prototyping														
Deliverables														
Progress Reports	X	X	X	X	X	X	X							
Midsemester					X									
Final Poster														
Meeting														
Client	X			X		X								
Team	X	X	X	X	X	X	X							

Expenses:

Date:	Item:	Cost:	Comments:
--------------	--------------	--------------	------------------

Design of Weight Distribution Monitoring System

Client: Dr. Willis Tompkins, Ms. Carol Rohl

Advisor: Dr. Thomas Yen

Team: Xiyu (Steve) Wang (xwang332@wisc.edu) – Team Leader

Dalton Hess (dhess2@wisc.edu) - Communicator

Kiersten Haffey (haffey@wisc.edu) - BSAC

Andrew Vamos (vamos@wisc.edu) - BWIG

Jacob Hindt (jhindt@wisc.edu) - BPAG

Date: 10/22/2013 – 10/29/13

Problem Statement

Stroke is a major issue in the United States with more than 800,000 yearly occurrences and 133,000 deaths every year. Many survivors of heart strokes experience brain damage that can leave their body permanently injured. A hemiplegic individual who suffered a stroke five years ago lost all senses on her left side of the body. She is ambulatory but suffers from improper walking and standing positions due to her left side. We are working on a portable device that will allow her to practice how it feels to stand with proper weight distributions. We hope that by practicing with our device, our client will be able to improve her walking and improve her overall quality of life.

Last Week's Goals

- Team will try to get access to the instrumentation room to start testing out the functions of the circuits
- Team will start looking at the various components of a circuit in order to do further testing (batteries, switch, mechanism)

Summary of Team Role Accomplishments

- Team attempted to analyze the voltage output of each of the five wires connected to and from the load sensors.

Summary of Design Accomplishments

- Team was able to isolate the power and ground wires coming out from the load sensors
- Team was able to determine the three different colors (gray, orange, and yellow) that produced voltages in accordance to force applied
- Andrew was able to secure 3 VCOs for free from Texas Instruments

This Week's Goals/Individual Goals

- Team will start designing a circuit and use different voltage sources to see if we can utilize the VCO
- Team will continue researching why our load cells have three wires instead of two
- Team will try to figure out why only the back load cells seem to influence output voltage for our three wires

Project Difficulties

- Although we were able to find the three important wires, through testing we found that it seems only the back left and back right load cells impact the output voltage for the wires. We are not sure why the front load cells are not affecting any of the three wires.
- We are also not sure why there is three wires for voltage output when there is usually only two.

Activities:

Date	Person(s)	Task	Time (Hours)	Weekly Total	Semester Totals
9.6.2013	Andrew	Client Meeting	1	2	20
9.8.2013		Group Meeting	1		
9.12.2013		Literature Research	1		
9.15.2013		Group Meeting	1		
9.19.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.2.2013		SolidWorks Design	2		
10.3.2013		Presentation Practice	3		
10.8.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
10.22.2013		Scale Voltage Testing	2		
9.6.2013	Dalton	Client Meeting	1	2	20
9.8.2013		Group Meeting	1		
9.8.2013		Literature Research	1		
9.15.2013		Group Meeting	1		
9.16.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.2.2013		Solidworks Design	2		
10.3.2013		Presentation Practice	3		
10.3.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
10.22.2013		Scale Voltage Testing	2		
9.6.2013	Jacob	Client Meeting	1	2	20.5
9.8.2013		Group Meeting	1		
9.9.2013		Literature Research	1.5		

Progress Reports	X	X	X	X	X	X	X									
Midsemester					X											
Final Poster																
Meeting																
Client	X			X		X										
Team	X	X	X	X	X	X	X									

Expenses:

Date:	Item:	Cost:	Comments:
10/22/2013	3 VCOs	\$0	Secured from Texas Instruments

Design of Weight Distribution Monitoring System

Client: Dr. Willis Tompkins, Ms. Carol Rohl

Advisor: Dr. Thomas Yen

Team: Xiyu (Steve) Wang (xwang332@wisc.edu) – Team Leader

Dalton Hess (dhess2@wisc.edu) - Communicator

Kiersten Haffey (haffey@wisc.edu) - BSAC Andrew

Vamos (vamos@wisc.edu) - BWIG

Jacob Hindt (jhindt@wisc.edu) - BPAG

Date: 10/27/2013 – 11/2/13

Problem Statement

Stroke is a major issue in the United States with more than 800,000 yearly occurrences and 133,000 deaths every year. Many survivors of heart strokes experience brain damage that can leave their body permanently injured. A hemiplegic individual who suffered a stroke five years ago lost all senses on her left side of the body. She is ambulatory but suffers from improper walking and standing positions due to her left side. We are working on a portable device that will allow her to practice how it feels to stand with proper weight distributions. We hope that by practicing with our device, our client will be able to improve her walking and improve her overall quality of life.

Last Week's Goals

- Team will start designing a circuit and use different voltage sources to see if we can utilize the VCO
- Team will continue researching why our load cells have three wires instead of two
- Team will try to figure out why only the back load cells seem to influence output voltage for our three wires

Summary of Team Role Accomplishments

- Team researched the possibility of using an Arduino Nano to output our signals. The Nano is significantly smaller than the Uno that the previous year's group used and can be easily placed onto our scale. With the use of a

microprocessor, it is feasible to output sound that corresponds to a musical scale.

Summary of Design Accomplishments

- Team continued testing on the circuit board and tried to analyze the relationship between orange, gray, and yellow wires
- Team started working on a circuit to input two different (or four) voltages from each load cells.

This Week’s Goals/Individual Goals

- Team will continue research on microprocessors by learning the code and familiarizing ourselves with ways to input voltages and outputting to a speaker
- Team will try to figure out the circuitry of the bathroom scale

Project Difficulties

- The wires for the load cells are hard to decipher. If we cannot figure it out soon, we will take apart one of the load cells. If we still cannot understand it, we will simply use the two load cells that Dr. Tompkins purchased for us and reconfigure the bathroom scale.

Activities:

Date	Person(s)	Task	Time (Hours)	Weekly Total	Semester Totals
9.6.2013	Andrew	Client Meeting	1	2	22
9.8.2013		Group Meeting	1		
9.12.2013		Literature Research Group	1		
9.15.2013		Meeting	1		
9.19.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.2.2013		SolidWorks Design	2		
10.3.2013		Presentation Practice	3		
10.8.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
10.22.2013		Scale Voltage Testing	2		
10.29.2013		Scale Voltage Testing	2		

9.6.2013	Dalton	Client Meeting	1	2	22
9.8.2013		Group Meeting	1		
9.8.2013		Literature Research Group	1		
9.15.2013		Meeting	1		
9.16.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.2.2013		Solidworks Design	2		
10.3.2013		Presentation Practice	3		
10.3.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
10.22.2013	Scale Voltage Testing	2			
10.29.2013		Scale Voltage Testing	2		
9.6.2013	Jacob	Client Meeting	1	2	22.5
9.8.2013		Group Meeting	1		
9.9.2013		Literature Research	1.5		
9.9.2013		Previous Member Meeting	1		
9.15.2013		Group Meeting	1		
9.18.2013		Literature Research	1		
9.29.2013		Group Meeting	1		
10.2.2013		Solidworks Design	2		
10.3.2013		Presentation Practice	3		
10.8.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
10.22.2013		Scale Voltage Testing	2		
10.29.2013		Scale Voltage Testing	2		

Final Poster															
Meeting															
Client	X			X		X									
Team	X	X	X	X	X	X	X	X	X						

Expenses:

Date:	Item:	Cost:	Comments:
10/22/2013	3 VCOs	\$0	Secured from Texas Instruments

Design of Weight Distribution Monitoring System

Client: Dr. Willis Tompkins, Ms. Carol Rohl

Advisor: Dr. Thomas Yen

Team: Xiyu (Steve) Wang (xwang332@wisc.edu) – Team Leader

Dalton Hess (dhess2@wisc.edu) - Communicator

Kiersten Haffey (haffey@wisc.edu) - BSAC Andrew

Vamos (vamos@wisc.edu) - BWIG

Jacob Hindt (jhindt@wisc.edu) - BPAG

Date: 11/3/13 - 11/9/2013

Problem Statement

Stroke is a major issue in the United States with more than 800,000 yearly occurrences and 133,000 deaths every year. Many survivors of heart strokes experience brain damage that can leave their body permanently injured. A hemiplegic individual who suffered a stroke five years ago lost all senses on her left side of the body. She is ambulatory but suffers from improper walking and standing positions due to her left side. We are working on a portable device that will allow her to practice how it feels to stand with proper weight distributions. We hope that by practicing with our device, our client will be able to improve her walking and improve her overall quality of life.

Last Week's Goals

- Team will continue research on microprocessors by learning the code and familiarizing ourselves with ways to input voltages and outputting to a speaker
- Team will try to figure out the circuitry of the bathroom scale

Summary of Team Role Accomplishments

- n/a

Summary of Design Accomplishments

- Voltage measurements between individual gray, yellow, and orange wires have been recorded
- The black and red wire has been determined simply to turn on and off the machine and not as the power supply for the load cells

This Week's Goals/Individual Goals

- Team will continue work on the circuitry in order to build an amplifier
- Team will use the separate load cells that Dr. Tompkins purchased and try to understand the functionality of those, as well as the feasibility of each load cells.

Project Difficulties

- It is possible we are measuring changes in voltage but need an amplifier to see the differences. Right now we are simply using 3 V and looking for voltage changes on the voltage scale but may need to look at the mV scale.
- Team is debating whether or not to simply take apart a load cell to understand it and work with only two load cells at the end (one on the left and on the right). Since we are not testing her weight distribution from the front to back, it is not necessary to have 4 load cells.

Activities:

Date	Person(s)	Task	Time (Hours)	Weekly Total	Semester Totals
9.6.2013	Andrew	Client Meeting	1	2	24
9.8.2013		Group Meeting	1		
9.12.2013		Literature Research Group	1		
9.15.2013		Meeting	1		
9.19.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.2.2013		SolidWorks Design	2		
10.3.2013		Presentation Practice	3		
10.8.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
10.22.2013		Scale Voltage Testing	2		
10.29.2013		Scale Voltage Testing	2		
11.05.2013		Scale Voltage Testing	2		

9.6.2013	Dalton	Client Meeting	1	2	24
9.8.2013		Group Meeting	1		
9.8.2013		Literature Research Group	1		
9.15.2013		Meeting	1		
9.16.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.2.2013		Solidworks Design	2		
10.3.2013		Presentation Practice	3		
10.3.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
10.22.2013		Scale Voltage Testing	2		
10.29.2013			Scale Voltage Testing		
11.05.2013		Scale Voltage Testing	2		
9.6.2013	Jacob	Client Meeting	1	2	24.5
9.8.2013		Group Meeting	1		
9.9.2013		Literature Research	1.5		
9.9.2013		Previous Member Meeting	1		
9.15.2013		Group Meeting	1		
9.18.2013		Literature Research	1		
9.29.2013		Group Meeting	1		
10.2.2013		Solidworks Design	2		
10.3.2013		Presentation Practice	3		
10.8.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
10.22.2013		Scale Voltage Testing	2		
10.29.2013		Scale Voltage Testing	2		
11.05.2013		Scale Voltage Testing	2		

Final Poster																
Meeting																
Client	X			X		X										
Team	X	X	X	X	X	X	X	X	X	X						

Expenses:

Date:	Item:	Cost:	Comments:
10/22/2013	3 VCOs	\$0	Secured from Texas Instruments

Design of Weight Distribution Monitoring System

Client: Dr. Willis Tompkins, Ms. Carol Rohl

Advisor: Dr. Thomas Yen

Team: Xiyu (Steve) Wang (xwang332@wisc.edu) – Team Leader

Dalton Hess (dhess2@wisc.edu) - Communicator

Kiersten Haffey (haffey@wisc.edu) - BSAC Andrew

Vamos (vamos@wisc.edu) - BWIG

Jacob Hindt (jhindt@wisc.edu) - BPAG

Date: 11/10/13 - 11/16/2013

Problem Statement

Stroke is a major issue in the United States with more than 800,000 yearly occurrences and 133,000 deaths every year. Many survivors of heart strokes experience brain damage that can leave their body permanently injured. A hemiplegic individual who suffered a stroke five years ago lost all senses on her left side of the body. She is ambulatory but suffers from improper walking and standing positions due to her left side. We are working on a portable device that will allow her to practice how it feels to stand with proper weight distributions. We hope that by practicing with our device, our client will be able to improve her walking and improve her overall quality of life.

Last Week's Goals

- Team will continue work on the circuitry in order to build an amplifier
- Team will use the separate load cells that Dr. Tompkins purchased and try to understand the functionality of those, as well as the feasibility of each load cells.

Summary of Team Role Accomplishments

- Dalton and Andrew were able to get their hands on the Arduino microprocessor and have started experimenting with programming

Summary of Design Accomplishments

- Team successfully connected two load cells to a differential amplifier to measure difference in voltage output between each.
- Pressing on one load cell increases the voltage while pressing on the other load cell decreases the voltage (in 10-20 mV scale)
- Arduino processing so far has yielded successful manipulation of the microprocessor to produce sound and even play a tune.

This Week's Goals/Individual Goals

- Continue interfacing with the load cells and start planning on how to integrate the circuit onto the bathroom scale
- Finalize programming on Arduino and decide whether to use the Arduino to read the different voltages or simply input the difference in voltages between the two

Project Difficulties

- The differential amplifier has residual voltage perhaps due to the various resistors used. Instead of equilibrating at 0 V, the differential op amp is outputting 0.2 to 2 V. What this means is that we will have to program the Arduino to measure the voltage and calibrate it to reference as 0.

Activities:

Date	Person(s)	Task	Time (Hours)	Weekly Total	Semester Totals
9.6.2013	Andrew	Client Meeting	1	4	26
9.8.2013		Group Meeting	1		
9.12.2013		Literature Research Group	1		
9.15.2013		Meeting	1		
9.19.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.2.2013		SolidWorks Design	2		
10.3.2013		Presentation Practice	3		
10.8.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
10.22.2013		Scale Voltage Testing	2		
10.29.2013		Scale Voltage Testing	2		
11.05.2013		Scale Voltage Testing	2		
11.10.2013		Scale Voltage Testing	2		
11.12.2013		Scale Voltage Testing	2		

9.6.2013	Dalton	Client Meeting	1	4	26
9.8.2013		Group Meeting	1		
9.8.2013		Literature Research Group	1		
9.15.2013		Meeting	1		
9.16.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.2.2013		Solidworks Design	2		
10.3.2013		Presentation Practice	3		
10.3.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
10.22.2013	Scale Voltage Testing	2			
10.29.2013		Scale Voltage Testing	2		
11.05.2013		Scale Voltage Testing	2		
11.10.2013		Scale Voltage Testing	2		
11.12.2013		Scale Voltage Testing	2		
9.6.2013	Jacob	Client Meeting	1	4	26.5
9.8.2013		Group Meeting	1		
9.9.2013		Literature Research	1.5		
9.9.2013		Previous Member Meeting	1		
9.15.2013		Group Meeting	1		
9.18.2013		Literature Research	1		
9.29.2013		Group Meeting	1		
10.2.2013		Solidworks Design	2		
10.3.2013		Presentation Practice	3		
10.8.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
10.22.2013		Scale Voltage Testing	2		
10.29.2013		Scale Voltage Testing	2		
11.05.2013		Scale Voltage Testing	2		
11.10.2013		Scale Voltage Testing	2		
11.12.2013		Scale Voltage Testing	2		
9.6.2013	Kiersten	Client Meeting	1	4	26
9.8.2013		Group Meeting	1		
9.9.2013		Literature Research Group	1		
9.15.2013		Meeting	1		
9.16.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.3.2013		Presentation Practice	3		
10.8.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
10.22.2013		Scale Voltage Testing	2		
10.29.2013		Scale Voltage Testing	2		
11.05.2013		Scale Voltage Testing	2		
11.10.2013		Scale Voltage Testing	2		

Meeting														
Client	X			X		X								X
Team	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Expenses:

Date:	Item:	Cost:	Comments:
10/22/2013	3 VCOs	\$0	Secured from Texas Instruments

Design of Weight Distribution Monitoring System

Client: Dr. Willis Tompkins, Ms. Carol Rohl

Advisor: Dr. Thomas Yen

Team: Xiyu (Steve) Wang (xwang332@wisc.edu) – Team Leader

Dalton Hess (dhess2@wisc.edu) - Communicator

Kiersten Haffey (haffey@wisc.edu) - BSAC Andrew

Vamos (vamos@wisc.edu) - BWIG

Jacob Hindt (jhindt@wisc.edu) - BPAG

Date: 12/01/2013 - 12/07/2013

Problem Statement

Stroke is a major issue in the United States with more than 800,000 yearly occurrences and 133,000 deaths every year. Many survivors of heart strokes experience brain damage that can leave their body permanently injured. A hemiplegic individual who suffered a stroke five years ago lost all senses on her left side of the body. She is ambulatory but suffers from improper walking and standing positions due to her left side. We are working on a portable device that will allow her to practice how it feels to stand with proper weight distributions. We hope that by practicing with our device, our client will be able to improve her walking and improve her overall quality of life.

Last Week's Goals

- Finalize circuit design so we can start Arduino interfacing
- Purchase batteries and circuit to start making the entire circuit
- Purchase a large button at the side for easy turning on for our client
- Still having a difficulting how to input signal into Arduino without amplifying it. We need to amplify the difference in voltage between the load cells, which is easily done with a differential amplifier
- Leaning left and right on the scale did not produce a noticeable difference in voltage

Summary of Team Role Accomplishments

- Dalton emailed our clients and extended invitations for the poster presentation
- Jake and Kiersten went to RadioShack top purchase materials
- Andrew coded and uploaded on the Arduino

- Steve designed the circuit board as well as the wirewrapping and soldering

Summary of Design Accomplishments

- Circuit has been transferred from breadboard to a printed circuit board Arduino integrated with circuit
- Device has been tested to be functional and ready for poster presentation

This Week's Goals/Individual Goals

- n/a

Project Difficulties

- n/a

Activities:

Date	Person(s)	Task	Time (Hours)	Weekly Total	Semester Totals
9.6.2013	Andrew	Client Meeting	1	18	48
9.8.2013		Group Meeting	1		
9.12.2013		Literature Research Group	1		
9.15.2013		Meeting	1		
9.19.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.2.2013		SolidWorks Design	2		
10.3.2013		Presentation Practice	3		
10.8.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
10.22.2013		Scale Voltage Testing	2		
10.29.2013		Scale Voltage Testing	2		
11.05.2013		Scale Voltage Testing Scale	2		
11.10.2013		Voltage Testing	2		
11.12.2013		Scale Voltage Testing	2		
11.20.2013		Scale Voltage Testing	4		
11.26.2013		Team Meeting Fabrication	1		
12.02.2013		Fabrication	8		
12.03.2013		Fabrication	4		
12.04.2013			6		

9.6.2013	Dalton	Client Meeting	1	7	37
9.8.2013		Group Meeting	1		
9.8.2013		Literature Research Group Meeting	1		
9.15.2013		Literature Research	1		
9.16.2013		Skype Session	1		
9.24.2013		Group Meeting	1		
9.29.2013		Solidworks Design	2		
10.2.2013		Presentation Practice	3		
10.3.2013		Report Writing	4		
10.3.2013		Scale Disassembly	2		
10.15.2013		Scale Voltage Testing	2		
10.22.2013		Scale Voltage Testing	2		
10.29.2013		Scale Voltage Testing	2		
11.05.2013		Scale Voltage Testing Scale	2		

11.10.2013		Voltage Testing	2		
11.12.2013		Scale Voltage Testing	2		
11.20.2013		Scale Voltage Testing	4		
11.26.2013		Team Meeting Fabrication	1		
12.02.2013		Fabrication	3		
12.04.2013			4		

9.6.2013	Jacob	Client Meeting	1	12	42.5
9.8.2013		Group Meeting	1		
9.9.2013		Literature Research	1.5		
9.9.2013		Previous Member Meeting	1		
9.15.2013		Group Meeting	1		
9.18.2013		Literature Research	1		
9.29.2013		Group Meeting	1		
10.2.2013		Solidworks Design	2		
10.3.2013		Presentation Practice	3		
10.8.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
10.22.2013		Scale Voltage Testing	2		
10.29.2013		Scale Voltage Testing	2		
11.05.2013		Scale Voltage Testing Scale	2		
11.10.2013		Voltage Testing	2		
11.12.2013		Scale Voltage Testing	2		
11.20.2013		Scale Voltage Testing	4		
11.26.2013		Team Meeting Fabrication	1		
12.03.2013		Fabrication	4		
12.04.2013			8		

9.6.2013	Kiersten	Client Meeting	1	12	42
9.8.2013		Group Meeting	1		
9.9.2013		Literature Research Group	1		
9.15.2013		Meeting	1		
9.16.2013		Literature Research	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.3.2013		Presentation Practice	3		
10.8.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
10.22.2013		Scale Voltage Testing	2		
10.29.2013		Scale Voltage Testing	2		
11.05.2013		Scale Voltage Testing Scale	2		
11.10.2013		Voltage Testing	2		
11.12.2013		Scale Voltage Testing	2		
11.20.2013		Scale Voltage Testing	4		
11.26.2013	Team Meeting Fabrication	1			
12.02.2013	Fabrication	3			
12.03.2013	Fabrication	3			
12.04.2013		5			
9.6.2013	Steve	Client Meeting Group	1	21	53
9.8.2013		Meeting	1		
9.9.2013		Previous Member Meeting	1		
9.11.13		Literature Research	1		
9.15.2013		Group Meeting	1		
9.17.2013		PDS	1		
9.24.2013		Skype Session	1		
9.29.2013		Group Meeting	1		
10.2.2013		SolidWorks Design	1		
10.3.2013		Presentation Practice	3		
10.8.2013		Report Writing	4		
10.15.2013		Scale Disassembly	2		
10.22.2013		Scale Voltage Testing	2		
10.29.2013		Scale Voltage Testing	2		
11.05.2013		Scale Voltage Testing Scale	2		
11.10.2013		Voltage Testing	2		
11.12.2013		Scale Voltage Testing	2		
11.20.2013		Scale Voltage Testing	4		
11.26.2013		Team Meeting Fabrication	1		
12.02.2013		Fabrication	8		
12.03.2013		Fabrication	4		
12.04.2013			8		

Timeline (Tentative):

Task	September				October				November				December	
	6	1	2	2	4	1	1	2	1	8	1	2	2	7
		3	0	7		1	8	5			5	2	9	
Project R&D				X										
Lit. Research		X	X	X										
Manufacturing					X	X	X	X	X					
Cost Estimation								X	X	X	X			
Prototyping											X	X	X	X
Deliverables														
Progress Reports		X	X	X	X	X	X	X	X	X	X	X	X	X
Midsemester							X							
Final Poster														
Meeting														
Client	X			X		X								
Team	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Expenses:

Date:	Item:	Cost:	Comments:
12/03/2013	Printed Circuit Board	\$2.49	From RadioShack
12/03/2013	8 ohm mini speaker	\$3.59	From RadioShack
12/04/2013	Illuminated Push Button	\$6.29	From RadioShack