BME 400: Biomedical Engineering Design

A Finger Plethysmograph to Measure Blood Resistivity

Clients:

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October 19th to October 26th

Problem Statement:

Our goal is to design a finger plethysmograph to measure blood resistivity. Impedance plethysmography may be used to measure arterial volume change that occurs with propagation of the blood pressure pulse in a limb segment. For this measurement, we assume a constant value of blood resistivity. However, blood resistivity may change under both physiological and pathological conditions. Use of an impedance plethysmograph on a finger immersed in a salt-filled beaker may yield a simple method for determining blood resistivity. This may develop into a method that diabetics can use to measure glucose level noninvasively.

Last Week's Goals:

- Begin finalizing the circuitry so that further testing can occur
- Start experimenting with saline solutions and current frequencies.

Summary of Accomplishments:

- Reviewed the additional documents sent by Ravi Shankar

- Developed a group of questions to send to Ravi Shankar to see if he has any insight.
- Met with Don Gi Hong and finalized the circuit design. The circuit was then drawn up using PSpice.
- Developed a component purchasing list so that we can order the necessary circuit components next week.

This Week's Goals:

- Order circuit components
- Begin finalizing finger holder design and start experimenting with a prototype.

Difficulties:

No difficulties thus far

Activities:

Tim Balgemann: Advisor Meetings: 1 hr
Research 2 hrs
Team Meeting: 4.5 hrs
Total: 7.5 hrs

Lucas Vitzthum: Advisor Meetings: 1 hr
Research 2 hrs
Team Meeting: 4.5 hrs
Total: 7.5 hrs

Nick Harrison: Advisor Meetings: 1 hr
Research 2 hrs
Team Meeting: 4.5 hrs
Total: 7.5 hrs

Tyler Lark: Advisor Meetings: 1 hrs
Research 3 hrs
Team Meeting: 4.5
Total: 7.5 hrs

Timeline:

BME 400:
A finger plethysmograph to measure blood resistivity

ID	Task Name	Start	Finish	Duration
1	Finish reading new documents from Ravi Shankar	10/21/2008	10/27/2008	5d
2	Finalize circuit design and order necessary circuit elements	10/24/2008	10/31/2008	6d
3	Build circuit and start LABview programming	11/3/2008	11/14/2008	10d
4	Building Finger Holder	11/3/2008	11/14/2008	10d
5	Begin initial testing and design modifications	11/10/2008	11/26/2008	13d
6	Finalize design	11/26/2008	12/1/2008	4d
7	Final paper drafting	11/21/2008	12/4/2008	10d
8	Final presentation drafting and practice	11/26/2008	12/5/2008	8d