

# **Tactile Auditory Sensory Substitution - Progress Report 11**

4/18/08-4/25/08

**Project Title:** Sensory Substitution Device for Hearing Impairment

## **Team Members:**

Becky Jones – Co-Team Leader  
rebeccajones@wisc.edu

Jimmy Fong – Co-Team Leader  
fong@wisc.edu

Jack Page – Communicator  
jdp@wisc.edu

Ryan Thome – BWIG  
thome@wisc.edu

Matthew Valaskey - BSAC  
mvalaskey@wisc.edu

## **Client:**

Veronica H. Heide, Au.D.  
Audible Difference  
vheide@audible-difference.com  
608.273.3036

## **Advisor:**

Mitchell E. Tyler, P.E., M.S.  
Dept. of Biomedical Engineering &  
Dept. of Ortho-Rehab Medicine  
University of Wisconsin - Madison  
metyer1@facstaff.wisc.edu  
608.265.3756

## **Problem Statement:**

The goal is to design and develop an auditory substitution device that through the use of vibrotactile stimulation can substitute for regional frequency hearing loss. We will continue the work from the last three semesters, mainly focusing on refining the technical operation of the prototype and obtaining clinical testing data on the performance of the system.

### **Statement of team goals:**

1. Obtain IRB approval
2. Update PDS (product design specification) and create semester schedule
3. Continue design project
  - a) Review progress from previous semesters
  - b) Brainstorm ideas for direction we want to take the project
  - c) Meet with experts to gain ideas about possible solutions
  - d) Develop possible design solutions
4. Research and develop housing refinements
5. Refine and conduct a clinical study on the performance of TASS
6. Miniaturize electronics to create more aesthetically pleasing device
7. Document and analyze findings in a print-ready manuscript
8. Prepare final presentation and poster
9. Conduct an outreach event for the community

### **Project Schedule**

1/25/08 – 2/1/08: Review progress from previous semesters. Organize schedule for semester. Revise and resubmit IRB.

2/1/08-2/8/08: Review and revise IRB documents for submission on February 8<sup>th</sup>. Further develop our testing procedure.

2/8/08 – 2/15/08: Prepare materials for testing. Begin optimizing the performance of the prototype. Begin running mock clinical trials.

2/15/08-2/22/08: Finalization of testing procedure to begin mock trials. Work on Midsemester presentation

2/22/08-2/29/08: Prepared java testing program and compiled everyone's parts of the midsemester presentation

2/29/08-3/7/08: Conducted community outreach project. Presented our work at the midsemester presentation.

3/7/08-3/16/08: Revised program for testing, Recorded word pair samples for testing. Created test cards for CCT.

3/16/08-3/28/08: Ran through the whole testing procedure. Made necessary corrections to test cards and data-logging.

3/30/08-4/8/08: Further improved signal processing algorithms. Debugged testing program. Tested system on Mitch.

4/9/08-4/17/08: Conducted final preparations for human testing. Ran tests on first three subjects and recorded the data.

4/18/08 –4/25/08: Continued to perform subject testing and recording data. Prepared for final poster presentation.

### **Summary of Team Accomplishments:**

1. Successfully completed more subject testing.
2. Worked on presentation and poster.
3. Analyzed preliminary data and results

**Statement of Team Goals for Upcoming Week:**

1. Finalize presentation and poster.
2. Work on final paper.
3. Finish outreach report
4. Give final presentation

**Team Difficulties:**

1. No significant difficulties this week.

**Activities and Individual Accomplishments:**

Group meetings: 5 hours

Ryan- 4 hrs: Setup hardware, conduct subject testing on computer.

Jack- 4 hrs: Conducted single/dual tone testing and examination of subjects

Jimmy – 4 hrs: Conducted CCT testing and consonant testing on subjects and preliminary analysis

Becky – 4 hrs: Informed subjects of the testing procedures and legal procedures.

Matt – 4 hrs: Recorded data for single, dual tone testing.

**Total hours for this week: 25 hrs**

**Cumulative hours to date: 177.5 hrs**