

ELEN4002/ELEN4012 - Minutes

School of Electrical & Information Engineering, University of the Witwatersrand, Private Bag 3, 2050, Johannesburg, South Africa

MEETING 1

Attendees:

Kayla-Jade Butkow, Kelvin da Silva, Prof. David Rubin

Agenda:

Obtain an overview of the requirements for the project outline specification

Minutes of meeting:

Start date: 09/03/2018

Start time: 13:00

Requirements for the document:

1. Specifications of the project
2. Milestones: Using Gantt Chart or timeline
3. Preliminary budget and resources
4. Risks or Mitigation: What do you do if you can't get a piece of equipment (what do you fall back on)

The minimum specifications for the project are as follows:

- There must be two hearing aids (one per ear)
- Each hearing aid must correct for the audiogram for that ear - To do this, you tweak the filter for each ear
- Directionality feature comes in mainly in processing - It is filtering of a signal based on direction (can possibly be done using cross correlation). This filtering changes the signal to noise ratio
- Ideas for directionality: The user changes the direction using a potentiometer or the user always hears best in the direction they are facing
- You must be able to turn off directionality
- Testing the device using humans is not specified in the brief of the project, but it can be done

Testing the device:

- Can use a signal generator to produce pure tones (single harmonic) and then examine the resulting signal after processing
- To test directionality, the sound source can be moved and the SNR examined
- It is also necessary to produce signals in the presence of noise and test using them

Audiogram:

- An audiogram is the response of each ear to different frequencies
- The magnitude in dB is with reference to some standard
- The layout of an audiogram is given in *Figure 1*

Budget:

- Is a huge constraint in the project
- It doesn't include any things you have in the house such as headphones

Ethics Clearance:

- For open day, you don't need ethics clearance

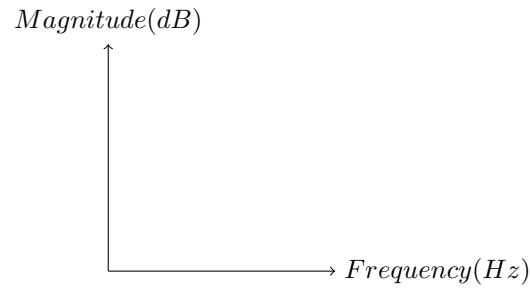


Figure 1 : Audiogram

- We need to decide how many people we would like to use to test the device
- We need to specify who the people are (colleagues and lecturers)
- Provide a protocol for testing

MEETING 2

Attendees:

Kayla-Jade Butkow, Kelvin da Silva, Prof. David Rubin

Agenda:

Review ethics clearance application

Minutes of meeting:

Start date: 03/04/2018

Start time: 13:00

The ethics form was reviewed and appropriate changes were made

MEETING 3

Attendees:

Kayla-Jade Butkow, Kelvin da Silva, Prof. David Rubin

Agenda:

Obtain an overview of the requirements for the project planning document

Minutes of meeting:

Start date: 20/06/2018

Start time: 13:00

Project Planning Document:

- Needs to Gantt chart which shows how the work will be split
- The document is a plan of the project assuming that everything is going to go exactly according to plan
- Needs to detail the full project implementation - can possibly include circuit diagrams and flow charts or algorithms

Engineering notebook:

- Use it as a diary - include dates and times for all entries
- Write down anything that you've done on that day - eg. sketch of a circuit, phone number of a supplier
- Put summaries of your minutes in the engineering notebook

The aim of the project is to develop a low cost hearing aid that is very simple to use. This means that the device only has a few buttons and is not fiddly. If we can achieve this, we can possibly work with Emoyo to develop a new low cost hearing aid solution.

The optimal directionality for the project would be that you are able to tune the direction using a dial, able to hear in the direction you are facing and able to turn off the directionality. This could be implemented using a combination of directional and non-directional microphones.

People to contact for the project:

- James Braid - Contacts in speech and hearing if necessary
- Keegan Malan - Ask for use of Kuduwave to test device and to obtain audiograms

To Do:

- Remind Prof. Rubin to email us audiograms
- Remind Prof. Rubin to enquire about a trial version of MATLAB for the project

Going forward, meetings are to be held once a week. Prof. Rubin will be away from the 29/06/2018 until **** and during this time, skype meetings will be held.