PROJECT STATUS REPORT 4

NOISE AND ECHO CANCELLATION IN A TELECONFERENCE

DATE: 6TH MAY 2015

PROJECT STATUS SUMMARY

Our goal in this project is to appropriately apply noise cancellation in such a way which enables the system to extract only the voice signal removing as much noise as possible for a great teleconference experience.

To complete the project successfully, our project group and tasks are divided into 3 parts: Android group, Theory group and Management group.

The project schedule is perfectly in line with the schedule and we are confident to complete the project within due date. If required, the members are also planning to accelerate the progress by working weekends and extended hours in the next few weeks.

WORK PLANNED TILL 6TH MAY, 2015

Android Part: As stated in the previous report, we have already completed all the android tasks before our own set deadline, and thus we didn't plan to work much on this part, rather refining our works to implement real time version of the algorithms.

Theory Part: The main goal was be to make research on below points:

- Non-linear algorithms: make a non-linear model and test them in MATLAB
- Wiener Filtering: improve results
- Test LMS in different scenarios being the main goal the avoidance of residual voice in the noise recordings
    - Record the noise from another room
    - Record from a louder noise source using an amplifier.
- Combine LMS and Wiener filtering.

Management Part: Following up the progress of the group was set as the core responsibility of the management group.

WORK COMPLETED TILL 6TH MAY, 2015

Android Part: As all the tasks were successfully completed on last week, we worked to refine our outcome on this part while trying to implement a real time version of the algorithms in a more efficient way. We have also made an interface for the android device to look it more vibrant and lively.

Theory Part: There have been different areas where we worked:

- LMS frequency domain: Some more tests done, but no significant progress.
- Non-Linear Algorithms: Some more tests done, but no significant progress.
- Wiener Filtering: Implementation and test done in theory (MATLAB). We were able to reduce the residual noise from the LMS noise significantly.

Management Part: Every members work progress was monitored and followed-up as required to finish everything within the set timeline and integrated to the progress report.

WORK PLANNED FOR NEXT WEEK

The main goal will be to make research on next points:

- Non-linear algorithms: Make an efficient non-linear model and test them in MATLAB
- Wiener Filtering: Fixing the non-causal filter and implement the causal filtering more efficiently while trying to improve the FIR as much as we can.
- Single-microphone speech enhancement techniques.

OPEN ISSUES

There is no new open issues other than fixing and improving the Non-Causal Weiner Filter to work in line with our project goal.

RISK ANALYSIS

The update of the risk analysis remains as the one in the project plan (see the table below).

Nr	Risk	P	C	R	Action
1	Do not find a good theoretical model	1	4	4	Read more literature
2	Do not pass the mid-term evaluation	1	4	4	Re-schedule the TRP
3	Problems with real time	2	4	8	Help and re-schedule TRP

As per the above table, the risk number 1 & 2 are less likely to affect our project outcome because we have good theoretical model with good performance and we have already completed all the 7 android tasks assigned for the mid-term evaluation.

Currently our main concern is the third risk factor, which might take a lot of time, but we are working hard to eliminate this risk factor as much as we can.

KEY PERFORMANCE INDICATORS (KPI'S)

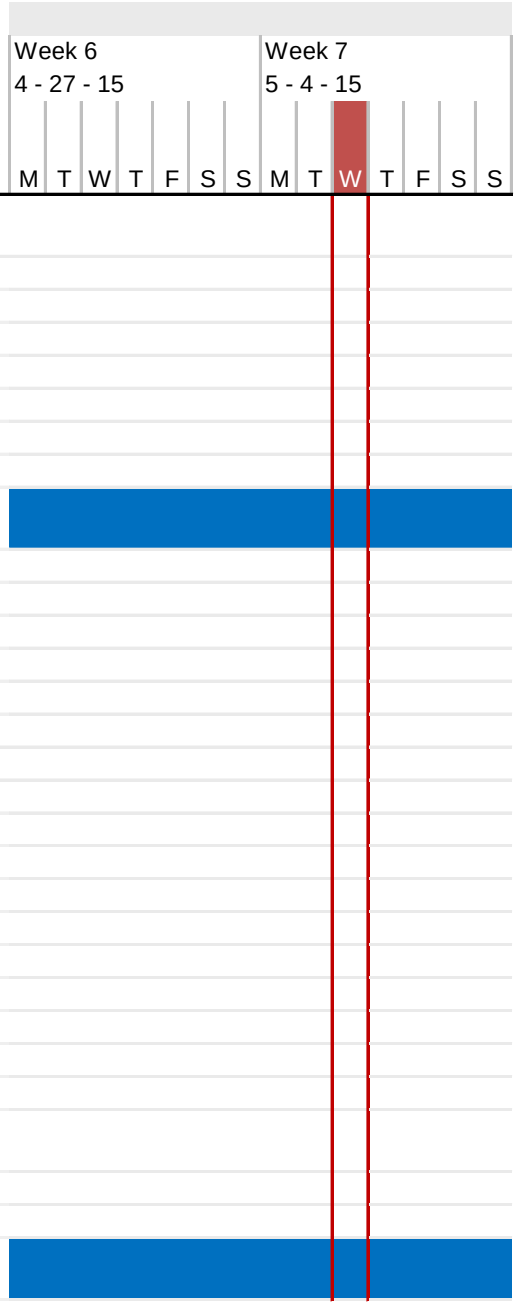
To have a better understanding of the progress of the project the Gantt chart and the working hours of every individual compared to resource allocation table is attached as annexures below:

Project in Wireless Communication - Project Schedule

EQ2400

Project Lead: Xavier Bush
Project Start Date: 3-25-2015 (Wednesday)
Display Week: 6

WBS	Task	Lead	Predecessor	Start	End	Cal. Days	% Done	Work Days
1	**Android Group (AG)**							
1.1	Task 1	Jonas		Wed 4-01-15	Mon 4-06-15	6	100%	8
1.2	Task 2	Mohammad		Wed 4-01-15	Mon 4-06-15	6	100%	8
1.3	Task 3	Mohammad		Wed 4-01-15	Mon 4-06-15	6	100%	8
1.4	Task 4	Thomas		Wed 4-01-15	Mon 4-06-15	6	100%	8
1.5	Task 5	All AG		Tue 4-07-15	Sat 4-25-15	19	100%	2
1.6	Task 6	All AG		Tue 4-07-15	Sat 4-25-15	19	100%	2
1.7	Task 7	All AG		Tue 4-07-15	Sat 4-25-15	19	100%	6
1.8	Full Implementation	ALL AG		Sun 4-26-15	Mon 6-01-15	37	45%	26
1.8.1	Transfer from MATLAB to Android							
1.8.2	Optimizing code							
1.8.3	Error handling solutions							
1.8.4	Placement of cancellation (Tx or Rx)							
1.8.5	Real time tests							
1.8.6	Real time optimizing							
2	**Theory Group (TG)**		All AG					
2.1	Theory Model		All AG	Wed 4-01-15	Sun 4-05-15	5	100%	3
2.1.1	Noise Cancellation Model							
2.1.2	Echo Cancellation Model							
2.1.3	LMS Implementation							
2.1.4	LMS Implementation							
2.1.5	Other Algorithms research							
2.2	First Tests		All AG	Mon 4-06-15	Wed 4-08-15	3	100%	3
2.2.1	LMS tests							
2.2.2	RLS tests							
2.2.3	Other Algorithms tests							
2.3	Alg. Optimization & solutions			Thu 4-09-15	Wed 4-22-15	14	60%	10
2.3.1	LMS Optimization							
2.3.2	RLS Optimization							
2.4	Transfer to Android & Optimization		All AG	Thu 4-23-15	Mon 6-01-15	1	40%	28



Display Week: 6

WBS	Task	Lead	Predecessor	Start	End	Cal. Days	% Done	Work Days
3	**Management Group (MG)**							
3.1	Project Paln	Xavier		Wed 3-25-15	Wed 4-01-15	8	100%	6
3.2	Progress Report 1	Animesh		Thu 4-02-15	Wed 4-15-15	14	100%	10
3.3	Progress Report 2	Animesh		Thu 4-16-15	Wed 4-22-15	7	100%	1
3.4	Progress Report 3	Animesh		Thu 4-23-15	Wed 4-29-15	7	0%	5
3.5	Progress Report 4	Animesh		Thu 4-30-15	Wed 5-06-15	7	0%	5
3.6	Progress Report 5	Animesh		Thu 5-07-15	Wed 5-13-15	7	0%	5
3.7	Progress Report 6	Animesh		Thu 5-14-15	Wed 5-20-15	7	0%	5
3.8	Progress Report 7	Animesh		Thu 5-21-15	Wed 5-27-15	7	0%	5
3.9	Final Report	Xavier		Thu 4-23-15	Tue 5-26-15	34	0%	24
4	**Individual Assignments**							
4.1	Reflective Diary 0	All members		Wed 3-25-15	Wed 4-01-15	8	100%	1
4.2	Reflective Diary 1	All members		Thu 4-02-15	Wed 4-15-15	14	100%	1
4.3	Reflective Diary 2	All members		Thu 4-16-15	Wed 4-22-15	7	100%	1
4.4	Reflective Diary 3	All members		Thu 4-23-15	Wed 4-29-15	7	100%	1
4.5	Reflective Diary 4	All members		Thu 4-30-15	Wed 5-06-15	7	100%	1
4.6	Reflective Diary 5	All members		Thu 5-07-15	Wed 5-13-15	7	0%	1
4.7	Reflective Diary 6	All members		Thu 5-14-15	Wed 5-20-15	7	0%	1

Annex 2	Cost/hour (SEK)	Day	30-Apr	01-May	02-May	03-May	04-May	05-May	06-May	Total
Animesh Das	400	Outcome (h)	0	0	0	0	5	5	6	16
		Plan (h)	6	0	0	0	4	4	4	18
Jonas Sedin	400	Outcome (h)	0	0	0	0	6	7	4	17
		Plan (h)	5	4	0	0	4	4	4	21
Mohammad Abdulla	400	Outcome (h)	0	0	0	5	6	5	6	22
		Plan (h)	5	2	0	5	5	5	5	27
Thomas Gaudy	400	Outcome (h)	0	2	4	2	9	7	7	31
		Plan (h)	0	6	1	1	6	6	6	26
Xavier Bush	400	Outcome (h)	0	0	0	2	7	8	2	19
		Plan (h)	5	0	0	0	4	6	4	19
		Outcome (h)								105
		Plan (h)								111