PROJECT STATUS REPORT 2

NOISE AND ECHO CANCELLATION IN A TELECONFERENCE

DATE: 22ND APRIL 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 22ND APRIL, 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.

Theory Part: Designing an efficient RLS algorithm and check with our system for better competency. Also we have planned to look into non-linear filters for better efficiency.

Management Part: Our plan was to update the group webpage with our photos and a short introductory video. Moreover, following up the progress of the group was also set as the core responsibility of the management group.

WORK COMPLETED TILL 22ND APRIL, 2015

Android Part: As all the tasks were successfully completed on last week, we only worked to refine our outcome on this part.

Theory Part: There have been different areas where to work:

- RLS: no much success with it.
- LMS frequency domain: has turned out to be substantially faster than the time domain (sample) LMS although the result is not as natural.
- Non-Linear Algorithms: there has only been one algorithm found on the literature on the internet which are the *Volterra* Series. No results yet.
- Wiener Filtering: latest approach considered (based on statistics and a voice-unvoice detector). In modelling process and without results in testing yet.

Management Part: A group picture was taken and a short video of every individual was shoot which will be integrated together for the group webpage. Moreover, every members work progress was monitored and followed-up as required to finish everything within the set timeline.

WORK PLANNED FOR NEXT WEEK

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

- Non-linear algorithms: make a non-linear model and test them in MATLAB
- Wiener Filtering with the new model
- 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.

OPEN ISSUES

Once we have had results in real time application from the Android section, now the main goal will be to research in new techniques not necessarily real-time oriented.

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)

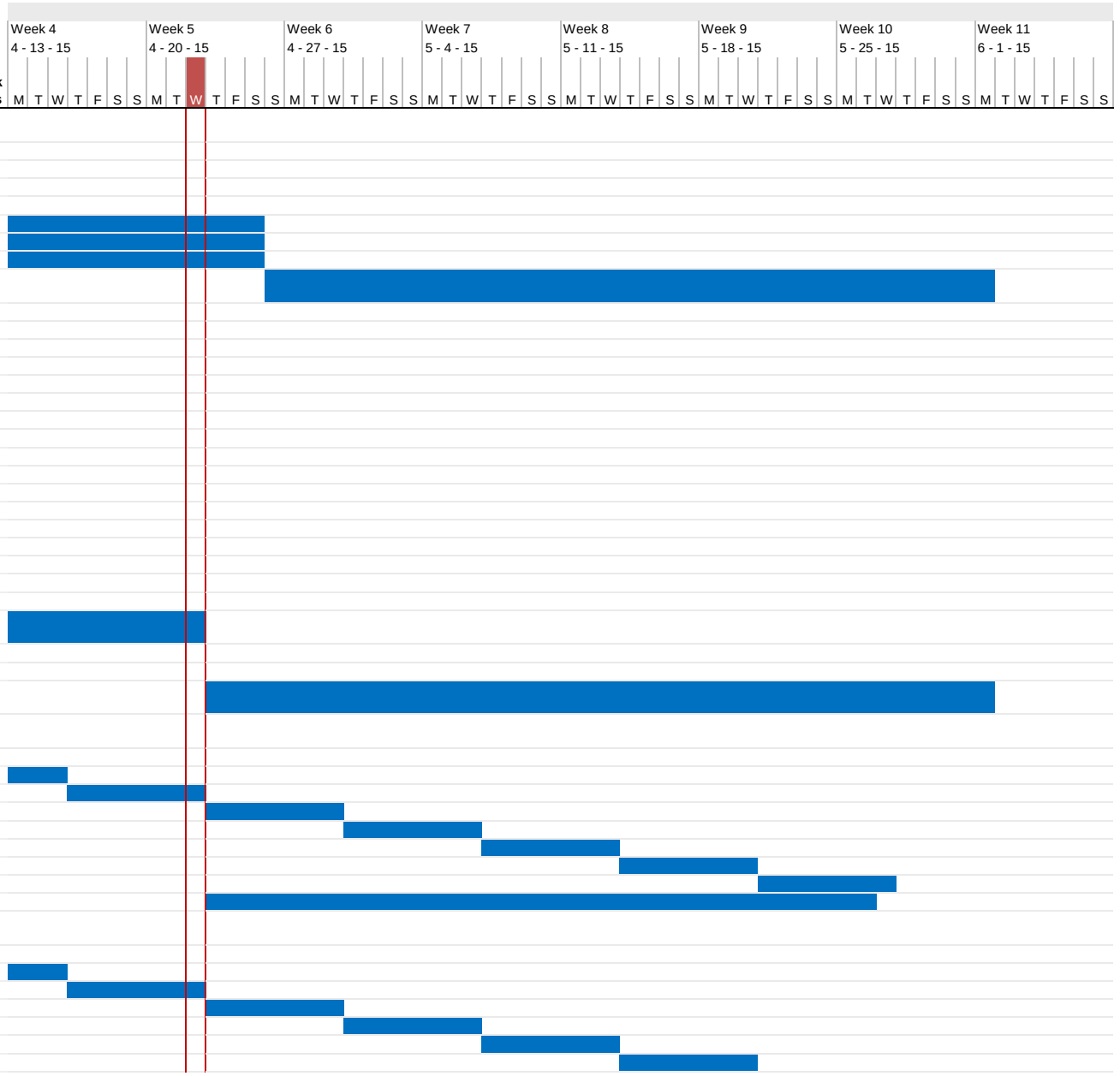
To have a better understanding of the progress of the project the Gantt chart and the working hours of every individual compared to resource allocation table is attached as annexures below:

Project in Wireless Communication - Project Schedule

EQ2400

Project Lead: Xavier Bush
Project Start Date: 3-25-2015 (Wednesday)
Display Week: 4

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	25%	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	40%	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	20%	28
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	0%	1
4.5	Reflective Diary 4	All members		Thu 4-30-15	Wed 5-06-15	7	0%	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	16/4	17/4	18/4	19/4	20/4	21/4	22/4
		Outcome (h)	3	6			4	6	7
Animesh Das	400	Plan (h)	6	6			4	6	6
		Outcome (h)	5	5			4	6	5
Jonas Sedin	400	Plan (h)	5	6			5	6	6
		Outcome (h)	5	0		2	5	6	6
Mohammad Abdulla	400	Plan (h)	5	4		4	5	5	5
		Outcome (h)	0	6	0	0	0	0	8
Thomas Gaudy	400	Plan (h)		6	1	1	6	6	6
		Outcome (h)	5	4			4	5	8
Xavier Bush	400	Plan (h)	6	6			6	6	6
		Outcome (h)							
		Plan (h)							