Analysis on the datasets running RR algorithm

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I. OBJECTIVE

1) To analyze whether respiratory signal can be extracted from the seven datasets using OURR estimation algorithms.

II. DETAILS

A. Datasets and respiratory signal

The method to analyze whether the datasets can be used to extract RR using the algorithm is as the following: (1). Run 100% SQI on all the datasets which contain PPG signals (2). Run respiratory rate algorithm for data of which have median SQI > 0.8 (3). Identify any errors in detecting RIIV, RIAV and RIFV.

Table I shows the updates of the datasets. All the datasets which contain PPG signal have been uploaded into 'bspprojects9\OURR. When running 100% SQI – all the data of each PPG – data which achived median SQI> 0.8 are recorded. The results show MIMICII data have 88% med SQI PPG of >0.8, CapnoBase 100%, DialysisI 97%, Dialysis2 91% and Dialysis3 80%. Calms2 shows a very good quality data where 99% has >0.8 med SQI. Oxford PICRAM has only 53% and Reading PICRAM has only 49% median SQI >0.8. The low SQI for PICRAM may be due to the motion artifacts since patients are out of the hospital. Further analysis will be done to investigate this low SQI for PICRAM data.

Then, RR estimation algorithms are applied to all the dataset which has >0.8 med SQI to see whether there are any errors occured. Data which shows error of any types, when applying the RR algorithm, are listed in the Table II. At the time this report is written, Calms2 error finding is still in the progress. At this moment, Calms2 has 42 data which have error when applying the RR estimation algorithm. Dialysis3 shows 10.7% and Dialysis2 has 3.8% data show error. The other datasets have than 4% except reading Picram which has 4 out 68 data show error.

Further analysis on what are the errors related to will be carried out soon. Hopefully I can report the findings by next week.

TABLE I
PHOTOPLETHYSMOGRAPHY DATA ANALYSIS

Name	MIMICII	CapnoBase	Dialysis 1	Dialysis 2	Dialysis 3	Calms-2	Picram
PPG Data Available	✓	✓	✓	✓	✓	✓	✓
PPG Data ⇑ 'bspprojects9\OURR'	✓	✓	✓	✓	✓	✓	Ox: ✓ Rd:✓
PPG Records (based on IDs)	954	42	96	574	374	336	Ox:199 , Rd:68
Reference Resp	950	42	96	574	374	(getting info)	Ox: 0, Rd: 0
Recording time	8 m	8 m	4.9∼5.2 h	2.3∼4.4 h	0.8∼6.0 h	0.2 h∼30.9 d	Ox: max single 75.2 days
Sampling Frequency (Hz)	125	300	75	75	256	75	75
Median PPG SQI > 0.8	839 (88%)	42 (100%)	93 (97%)	527 (91%)	300 (80%)	332 (99%)	Ox:105 (53%) Rd:33 (49%)
Resp. Signal Extraction Done	✓	✓	✓	✓	✓	✓	✓
Errors Data when extracted	2 (0.2%)	0 (0%)	0 (0%)	20 (3.8%)	32 (10.7%)	42 (still in progress)	Ox:4 (3.8%), Rd:4 (12.1%)

B. StAR II study

I will update the status of StAR II study next week, as the Skype call with Dave Springer, Andrew Farmer, Maarten de Vos and John Prince si scheduled on the 10 February 2016, 2 pm.

TABLE II
DATA SHOWS ERROR WHEN APPLYING THE RR ESTIMATION ALGORITHMS

MIMICII	CapnoBase	Dialysis 1	Dialysis 2	Dialysis 3	Calms-2	Picram
s17944_3433_04_17_17_40	none	none	OB10 111103	DF01_131118.mat	pt106	Ox048
s32288_2617_12_29_16_39	none	none	OB14 111109	DF01_131125.mat	pt112	Ox105
			OB17 120222	DF01_131127.mat	pt113	Ox136
			OB2 121029	DF07_131125.mat	pt114	Ox137
			OB23 120206	DF11_140124.mat	pt11	Rd002
			OB30 121009	DF13_140109.mat	pt126	Rd014
			OB35 120118	DF14_140113.mat	pt12	Rd023
			OB35 120210	DF17_140212.mat	pt135	Rd039
			OB35 120521	DF20_140208.mat	pt138	
			OB36 120614	DF20_140227.mat	pt13	
			OB37 111020	DF21_140219.mat	pt146	
			OB49 120127	DF21_140221.mat	pt147	
			OB6 120124	DF21_140224.mat	pt155	
			OB6 120131	DF21_140226.mat	pt159	
			OB62 120209	DF23_140425.mat	pt161	
			OB7 120214	DF23_140430.mat	pt165	
			OB7 120228	DF23_140502.mat	pt167	
			OB7 121016	DF23_140507.mat	pt168	
			OB79 120531	DF23_140515.mat	pt172	
			OB79 120726	DF30_140501.mat	pt174	
				DF30_140506.mat	pt185	
				DF30_140515.mat	pt209	
				DF33_140424.mat	pt223	
				DF33_140426.mat	pt224	
				DF34_140423.mat	pt226	
				DF34_140425.mat	pt232	
				DF45_140712.mat	pt234	
				DF48_140804.mat	pt236	
				DF53_140805.mat	pt238	
				DF59_140825.mat	pt252	
				DF59_140827.mat	pt254	
				DF60_140826.mat	pt262	
					pt263	
					pt266	
					pt26	
					pt277	
					pt279	
					pt280	
					pt281	
					pt283	
					pt286	
					pt28	
					con't	