RR estimation MAE for 8 datasets

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I. Objective

1) To update the RR estimation Mean Absolute Error (MAE) of all datasets.
2) To give result of Picram RR estimation.

II. Algorithm used

In Progress Report 30, MIMIC-II, CapnoBase and Dialysis3 MAE results have been presented. By using the same method as in previous report, evaluation using Dialysis1, Dialysis2 and Vortal have been carried out. For this week, the reference respiratory signal has been filtered (low pass) to eliminate frequencies above respiratory frequency. The result of the RR estimation MAE is shown in Table I and boxplot in Fig.1. From this result, by using MIMIC-II, Dr. Pimentel has achieved 1.78-5.57 br/min compared to 3.67-8.65 br/min from this report for MAE 25th-75th percentile. For CapnoBase, Dr. Pimentel managed to get 0.28-3.29 br/min compared to 0.61-4.34 br/min for this report. Thus, it is still slightly bad compared to Dr. Pimentel's result. Using the same method, 84 PPG signal from different patient of Picram dataset have been used to estimate the RR. The result is shown in the histogram in Fig.2. From this result, it shows that the estimated RRs fall between 8-30 br/min with median at 15 br/min. This result shows that the method used for RR estimation might be good as the result is quite good for 8 datasets including the synthetic one and Picram. For Picram, no MAE is available as there are no reference respiratory signal.
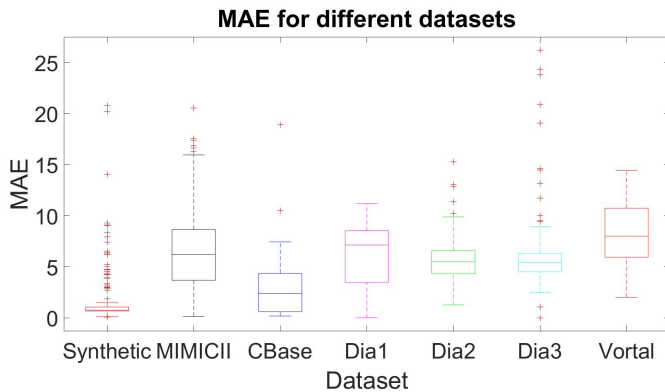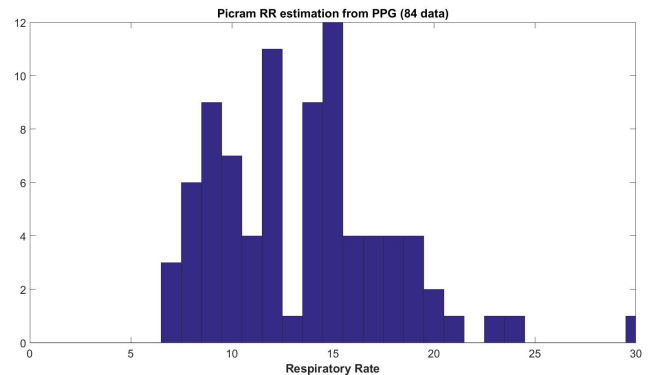

Fig. 1. RR estimation MAE results

Fig. 2. Respiratory rate estimation from PPG signal of Picram dataset

TABLE I
RR estimation MAE details

Dataset	Data Size	PPG f_s	Ref Signal f_s	25th Percentile	Median	75th Percentile
Synthetic	192	500	500	0.68	0.76	1.06
MIMIC-II	784	125	125	3.67	6.20	8.65
CapnoBase	42	300	300	0.61	2.38	4.34
Dialysis 1	96	75	60	3.45	7.13	8.52
Dialysis 2	554	75	32	4.32	5.48	6.57
Dialysis 3	364	256	64	4.51	5.45	6.31
Vortal	74	500	500	5.94	8.00	10.73

III. Star2 project

This week, a complete new 'procedure' which is the questionnaire to be answered by the patient, has been developed and successfully uploaded to the demo server demo.sana.csail.mit.edu. The uploaded data have been confirmed by view-encounter-queue page at demo.sana.csail.mit.edu/openmrs/module/sana/queue/v1/queue.form. A few things need to be careful here are the 'concepts' and 'type' of questions. The new concept is added using the Dictionary tab of the same web page. Adding new page or the question is quicker when the formats are well understood. As in progress report 30, both Samsung Galaxy Tab 2 10.1 P5100, connected to PC and Nexus 5 API 19 emulator have been used to input the data. The new procedure

in .xml format is located at sana.mobile-master/app/src/main/res/raw and to enable it, the procedure needs to be added at app/src/main/java/org/sana/android/util/SanaUtil.java of the Android Studios. For the next task, I will try to develop a some other complicated format of procedures while waiting for the srvubusar001.uct.ac.za server to be operated.