Real-time Extraction of Respiratory Sinus Arrhythmia for Application into Actual Environment

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OBJECTIVES

Development of real-time and high-accuracy extracting method of RSA(Respiratory Sinus Arrhythmia), which is <u>a selective index of</u> <u>cardiac vagal activity</u>, and application into actual environment.

Respiratory-phase domain analysis of RSA

Signal processing in each respiration (4 sec~)
Possible to detect and remove accidental Noise

On rest condition, Respiratory-phase domain analysis <u>followed the mental workload level more</u> <u>closely</u>, had the <u>greater stability as an index</u> than did frequency domain analysis which is conventional approach to RSA.



Development of extracting method robust to body motion



To improve the previous method robust to body motion, we use two respiratory sensors, Respiration belt and Thermistor.

Thermistor is more accurate than Respiration belt in terms of robustness to body motion.





Respiratory belt

Proposed method using two sensors, didn't be affected by body motion, in comparison with previous method using Respiration belt only.

Ref.) K.Kotani, et. al., Analysis of respiratory sinus arrhythmia with respect to respiratory phase, Methods Inf Med., 153-156, 2000