

Non-linear Results

Variable

Units Value

Poincare Plot

SD 1	cm _s	39.5
SD 2	cm _s	42.7
SD 2 / SD 1		1.080

Approximate Entropy (ApEn)

Sample Entropy (Samplen)

Detrended Fluctuation Analysis (DFA)

Short-term fluctuation, α_1

Long-term fluctuation, α_2

OBSERVATIONS

→ Low values of SDNN indicate no variability and it is possibly the most used index to measure the long term HRV.

CONCLUSIONS

- 1) In this experiment, we learnt how to use the KUBIOE HRV STANDARD SOFTWARE
- 2) Further learnt that, heart rate variability is an important tool in cardiology, since it helps investigate the sympathetic and parasympathetic functions of the ANS.

RESULTS AND OBSERVATIONS.Time Domain

<u>Variable</u>	<u>Units</u>	<u>Value</u>
Mean Pn'	(ms)	959
Mean HR'	(bpm)	63
Min HR	(bpm)	60
Max HR	(bpm)	66
SDNN	(ms)	40.7
RMSD	(ms)	55.2
NN50	beats	10
PNN50	(%)	25.64
RR triangular index		10
TINN	(ms)	159.0
Stress Index (SI)		10.5

Frequency Domain

<u>Variable</u>	<u>Units</u>	<u>VLF</u>	<u>LF</u>	<u>HF</u>
Frequency band	(Hz)	0.06-0.04	0.04-0.15	0.15-0.40
Peak frequency	(Hz)	0.040	0.070	0.348
Power	(ms ²)	34	801	929
Power	(log)	3.640	6.686	6.830
Power	(%)	1.96	45.60	52.51
Power	(0.0)		46.40	53.56
Total Power	(ms ²)	1361		
Total Power	(log)	4.444		
LF/HF Ratio		0.866		
EDA	(mV)			

Date _____

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DETECTION OF R-WAVE

1. Peak level estimation:

2 min duration rectified signal was sorted in decreasing order.

The first two data points were averaged to get an estimation of R-peak amplitude.

METHOD - Decision Rule (Thresholding):

70% of the average R-peak was taken as threshold to detect R-peak from the rest of the signal.
A blanking

MRV Calculation

Method

1. Time Domain
2. Frequency Domain (FFT)

Carried the ECG leads for lead-2. Attack finger pulse
Check computed input for Heart Rate (HR)

Learn how to verify

1. Have the subject still. Record baseline vital issues.
Have subject take a deep breath and hold then
push against a cold glottis.

Teacher's Signature _____

FFT

Fast Fourier Transform (FFT) is an algorithm that computes the Discrete Fourier Transform (DFT) of a sequence or its inverse (IDFT). Fourier analysis converts a signal from its original domain to a representation in the frequency domain, and vice versa.

3 types of frequency.

1. VLF - very low frequency
2. LF - low frequency (0.04 - 0.15 Hz)
3. HF - high frequency (0.15 - 0.21 Hz)

Steps

1. Noise elimination
2. Type II lead.
3. To produce R-peak.

METHOD

The saw ECG was first processed by using a band pass filter with cut-off frequencies of 0 and 16 Hz.

Description.

1. Atmosphere thermal noise.
2. Power frequency noise.

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EXPERIMENT - 5B

Aim :- To learn how to use HRV software.

Theory

HRV : Heart Rate Variability.

It is simply a measure of the variation in time between each ~~interval~~ heartbeat. This variation is controlled by a primitive part of the nervous system called the automatic nervous system (ANS).

HRV is an interesting and non-invasive way to identify the ANS imbalance. If a person's system is in state of a fight or flight mode, the variation between subsequent heartbeats is low. If one is in a more relaxed state the variation betw

Poincaré Plots

It is a type of sequence plot used to quantify self-similarity in process, usually periodic functions.

The poincaré plot analysis is a geometrical and non-linear method to assess the dynamics of HRV.