ECG and Activity Monitoring: what can we learn?

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Electrocardiogram: electrical activity of your heart
16 beats in 18 seconds = 53 bpm

1/RR interval = instantaneous HR

My ECG at rest
\[ F = ma \]

\[ \text{Gravity} = -9.8 \text{ m/s}^2 = -1g \]
Data sets:
1. Daily activities
2. Sleep
Heart rate: 57 bpm

Respiration

Me resting

Sitting
Heart rate: 147 bpm

Me cycling

Respiration

False steps?

Voltage (volts)

Acceleration (g)

Time (minutes)
Lesson 1:
HR changes a lot.
Lesson 2: HR changes are interesting, but need more data over time.
Falling asleep

Left side   Right Side       Toss/Turn

Stomach

Fitbit sleep efficiency: 95%
Time to fall asleep: 6 min

Artifact

Turn

Shift

Sleep - night one

Falling asleep

Stomach

Time (minutes)

Accel X

Accel Y

Accel Z

X

Y

Z

Left side  Right Side  Toss/Turn
Each data point = 60 beat average
NOT NOISE!!!

Heart rate variability
NOT NOISE!!!

Heart rate variability

RR interval - night 1

Time (minutes)
Lesson 3: ECG data reveals Premature Atrial Contractions, primarily during sleep.
Takeaways
Other cool stuff:
- HRV
- Resp. rate
- CV dynamics
- Trends over time
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