

T1.2 – Motivação

Proc. Sinal e Imagem
Mestrado em Informática Médica

Miguel Tavares Coimbra

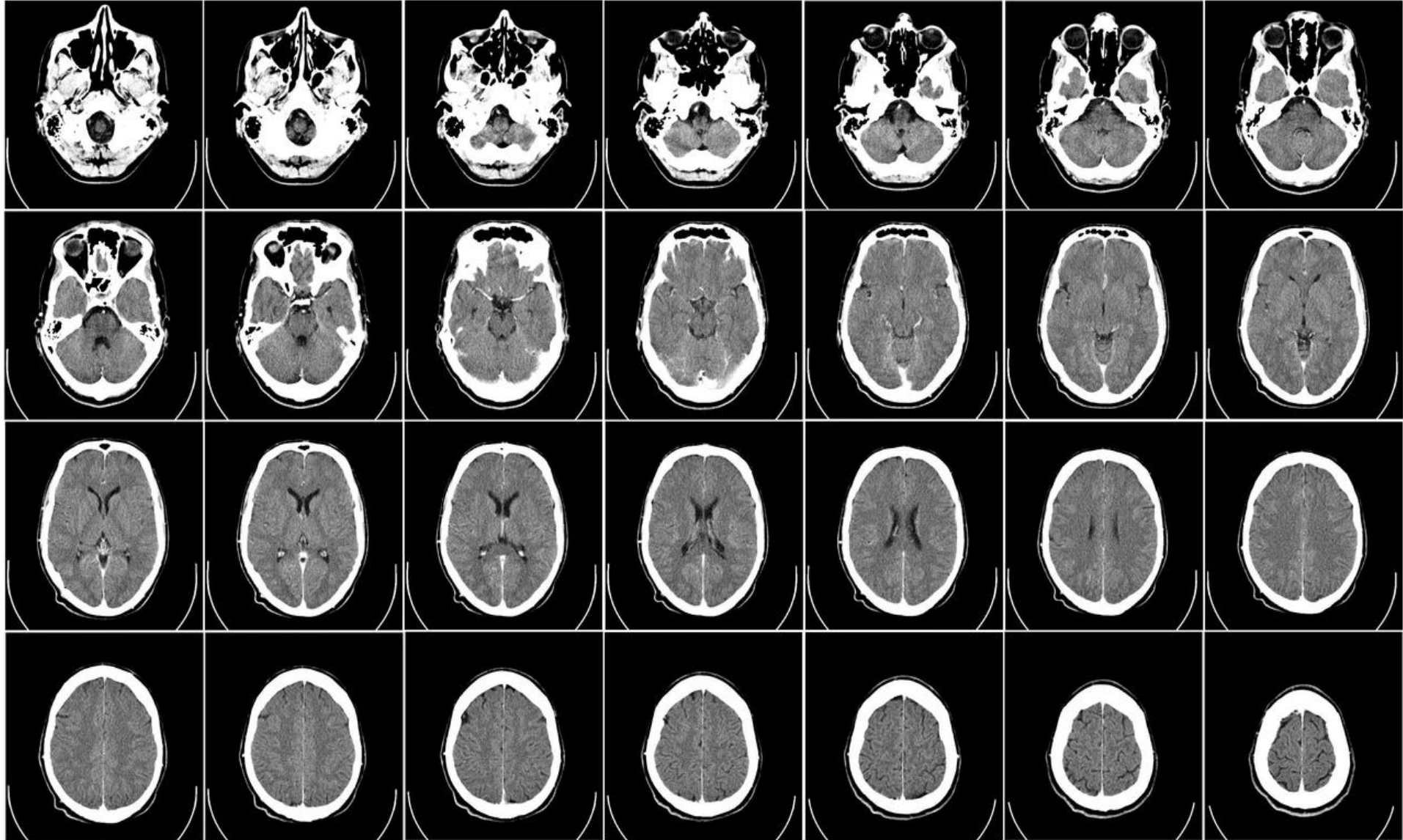
Qual a motivação para processarmos sinal?

Sinal e Imagem Médica

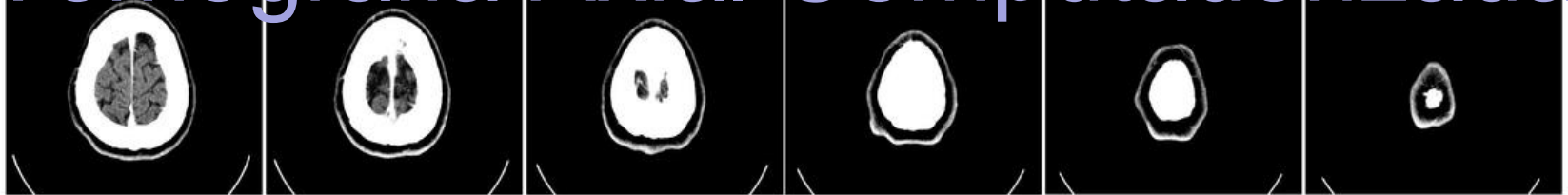
(aos quais já estamos bem habituados...)

Radiografia





Tomografia Axial Computadorizada



Pre-PDT

24-hr

Ressonância Magnética

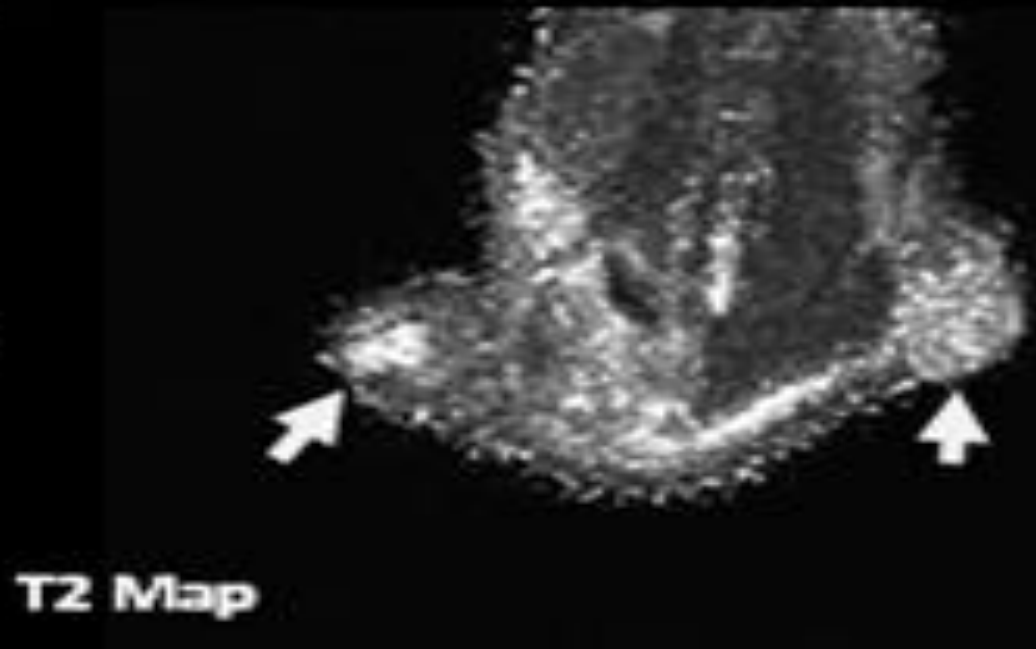
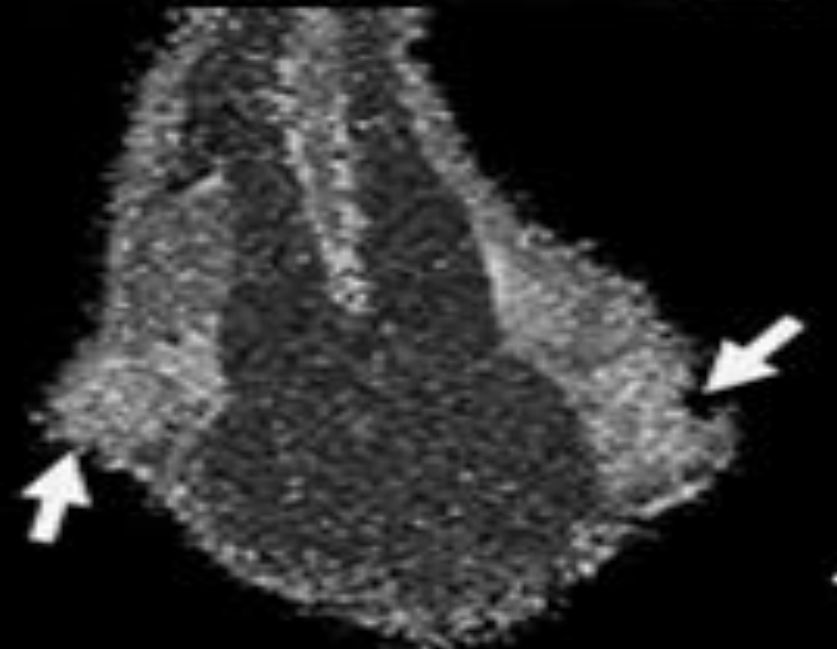
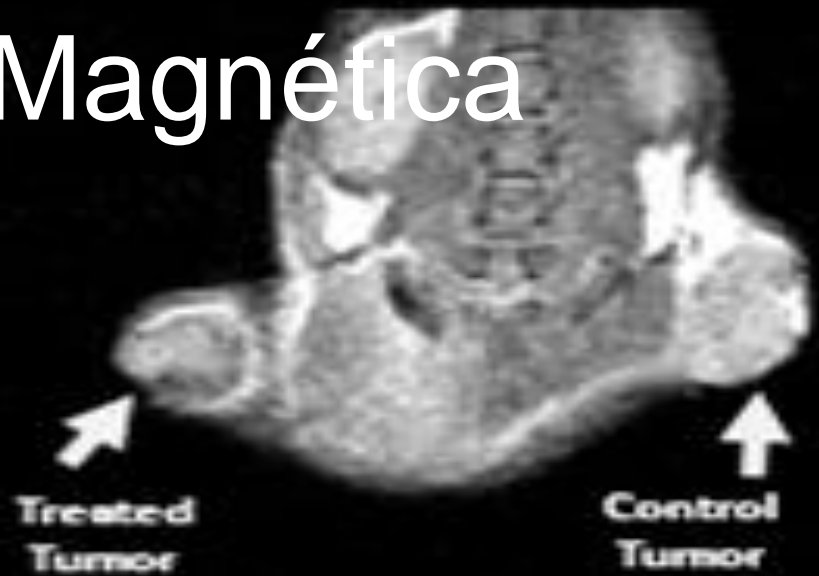
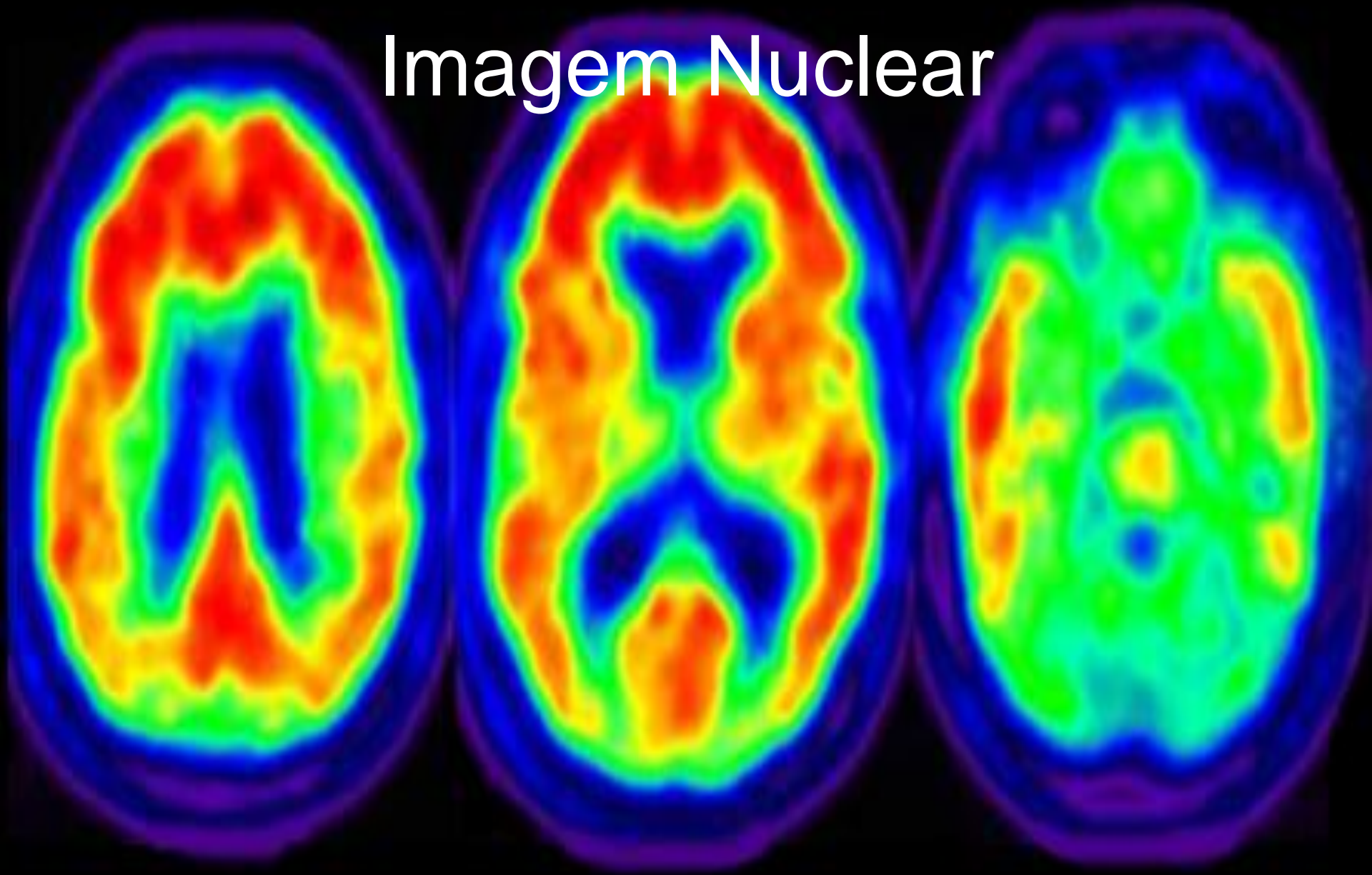


Imagem Nuclear



Microscopia



Ultrassom

Voluson
E8

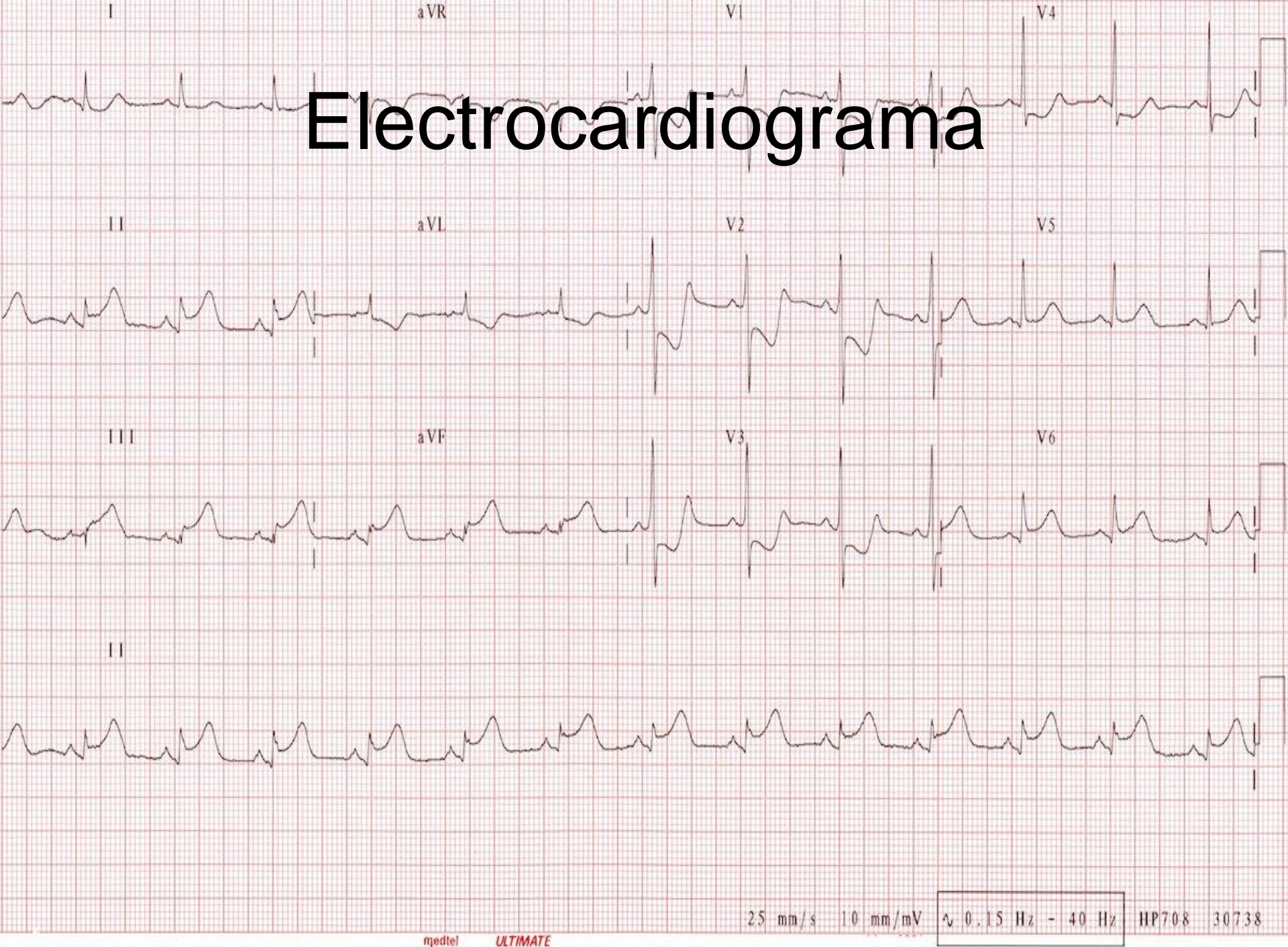
Routine
Har-high
97
Gn 10
C6 / M7
P5 / E3
SRI II 5



CRL

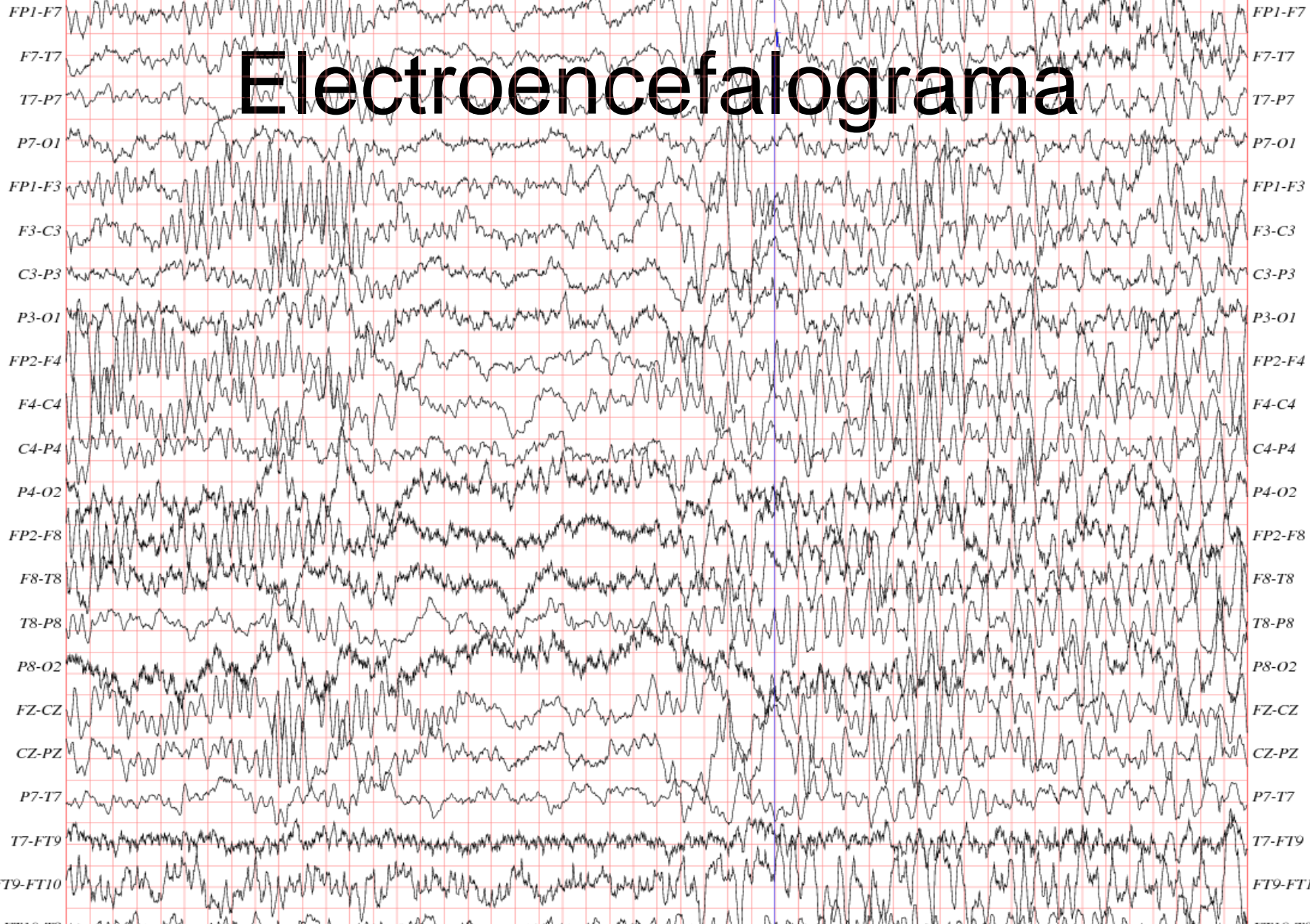
CRL 6.51cm
GA 12w6d 71.8%

Electrocardiograma



2.5 mm/s 10 mm/mV $\approx 0.15 \text{ Hz} - 40 \text{ Hz}$ HP708 30738

Electroencefalograma

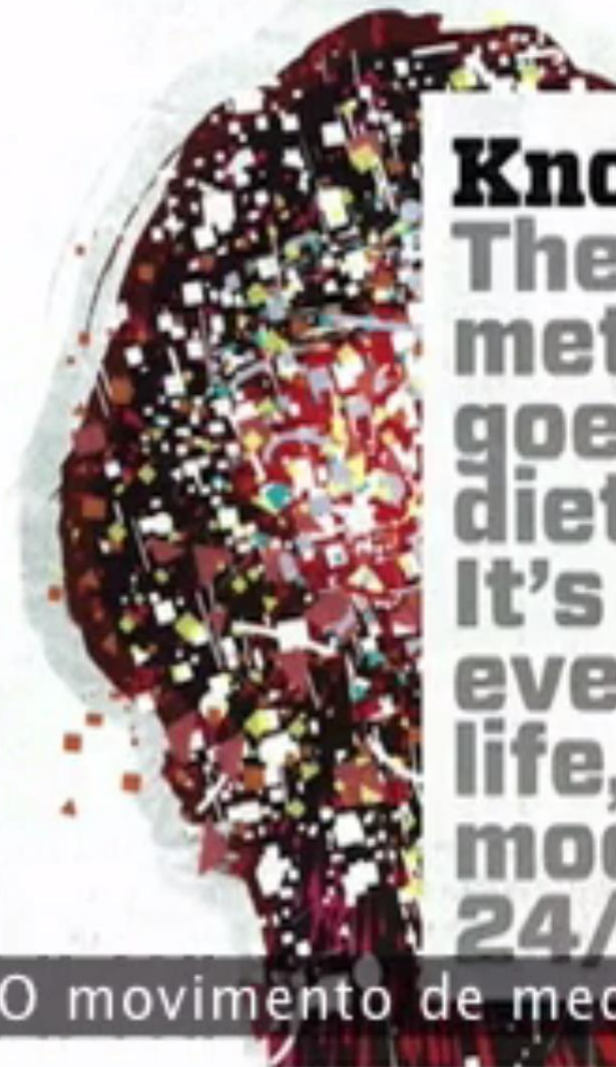


Sinal e Imagem Médica

(que pareciam ficção científica há poucos anos atrás...)

Erik Topol, 2009

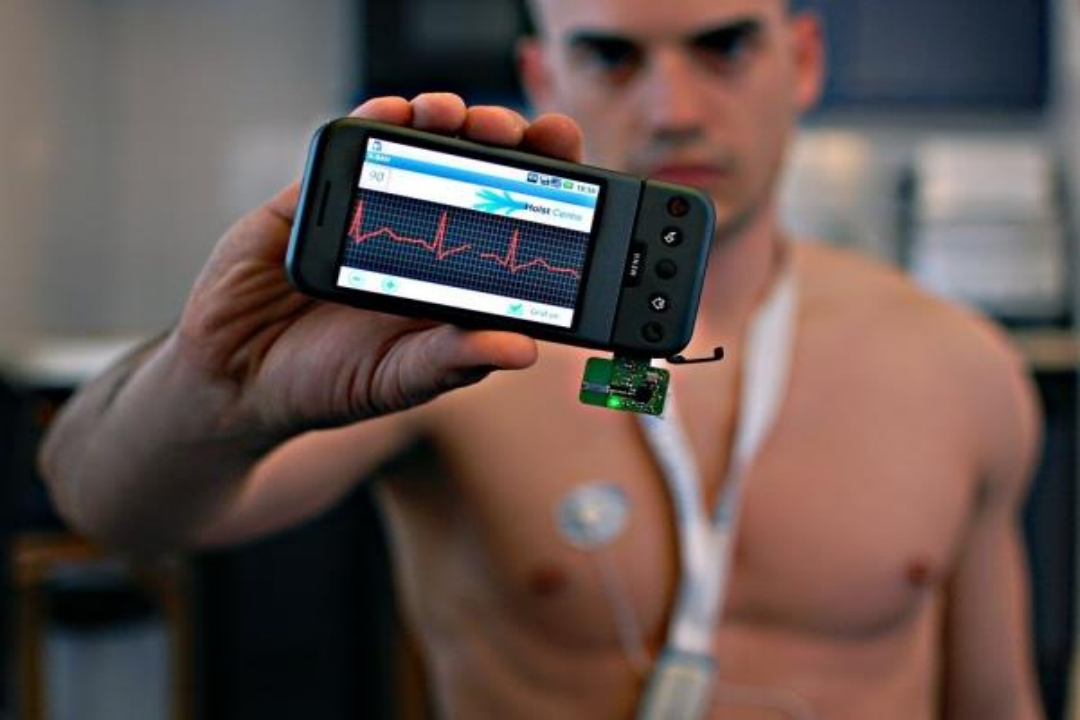
Wired, July 2009



Know Thyself
The personal metrics movement goes way beyond diet and exercise. It's about tracking every facet of life, from sleep to mood to pain, 24/7/365.

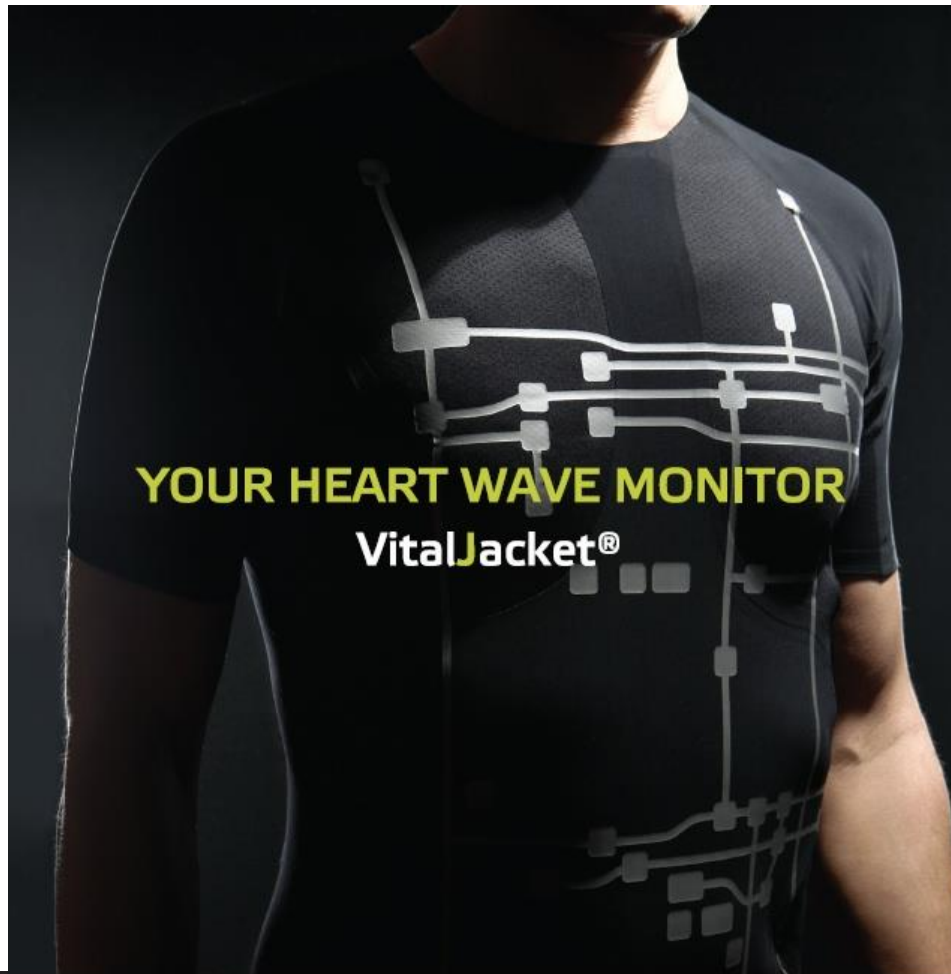
"O movimento de medidas pessoais vai além





Estudo de Caso: Vital Responder

Monitoring Stress Among First Responder Professionals





ital **R**esponder

00:30



Electrocardiograma 2.0

VitalJacket® HWM
YOUR HEART WAVE MONITOR

Medical equipment
DO DOVCOM

pitaval

Electrocardiograma



Variabilidade RR



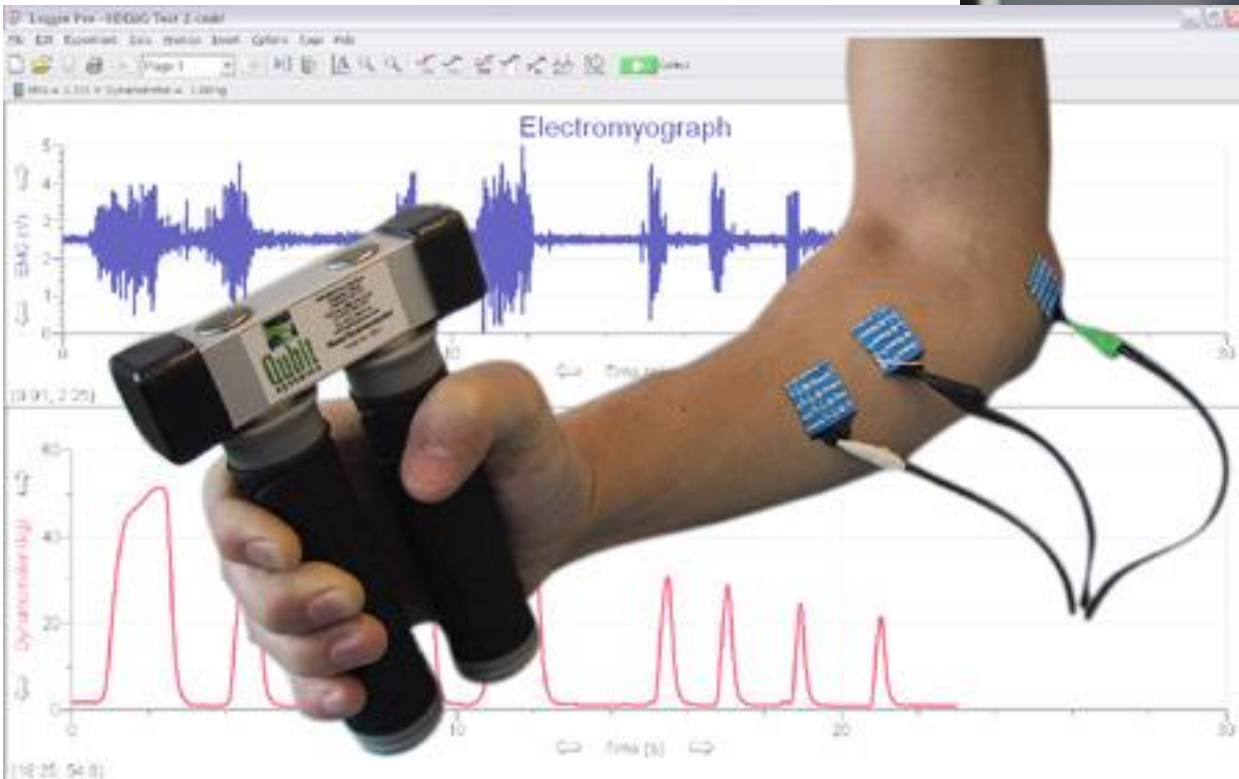
EEG



<https://www.youtube.com/watch?t=55&v=T7CiiWBwMgw>

EMG

Wearable EMG



Very Famous Person

Smartphone Sensing

Samsung S4

- Accelerometer
- Gyroscope
- Light
- Magnetic Field
- Atmospheric Pressure
- Proximity
- Temperature
- Humidity
- Sound Levels
- GPS



Smartwatch Sensing



Como usamos todo este sinal em benefício da Saúde?

Processar, processar, processar,
processar, processar, processar,
processar, processar

'The Big Picture'

Realidade



Quantificação da Realidade

Rain

Stress

Wind

Heart Rate

Emotions

Fatigue

Muscle strength

Body posture

PSI 15/16 - T1.2 – Motivação
Ball Speed



Para um Mundo Digital



Quero transformar variáveis reais em informação digital

Em tempo real, não obtrusivamente, em situações reais, por períodos de tempo longo, com elevada precisão

Sistemas Ciber-Físicos

Bridges between physical and cyber worlds

