Biofeedback for Immersive Education
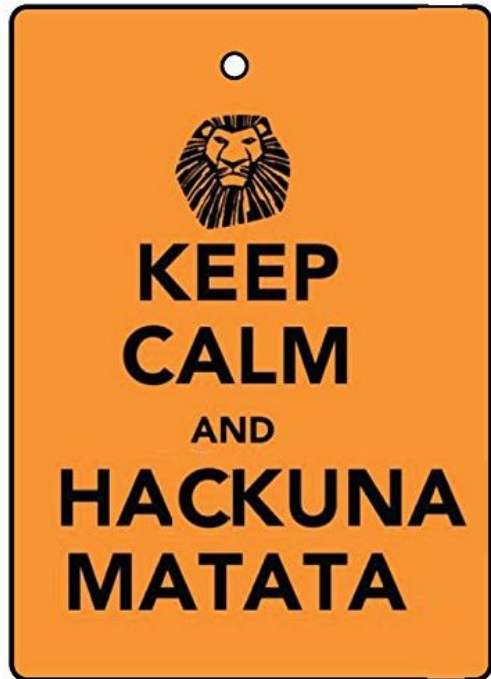
Oxford Hackathon
Nov 2018

Hackuna Matata team

KEEP CALM AND HACKUNA MATATA

OXFORD HACK 2018

aws

High school students

- Compulsory education
- About to decide their university careers/jobs
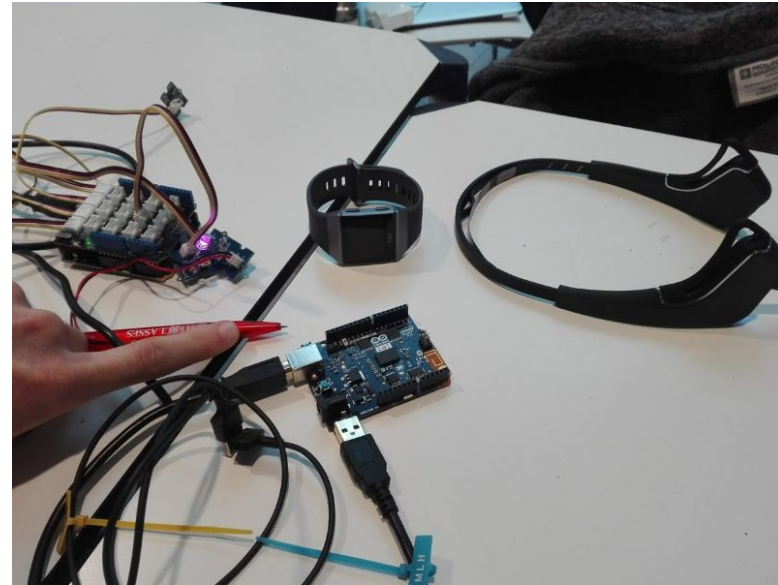
Sensors - what are we measuring

We are quantifying attention with:

- Fitbit's Heart rate
  - Low heart rate indicates the student is bored/sleepy
- Fitbit's accelerometer
  - High movement indicates the student is distracted
- Muse headband's EEG
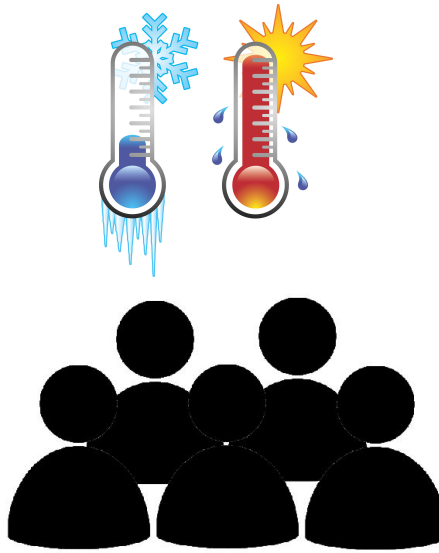 - Different frequency brain waves

We are measuring classroom's
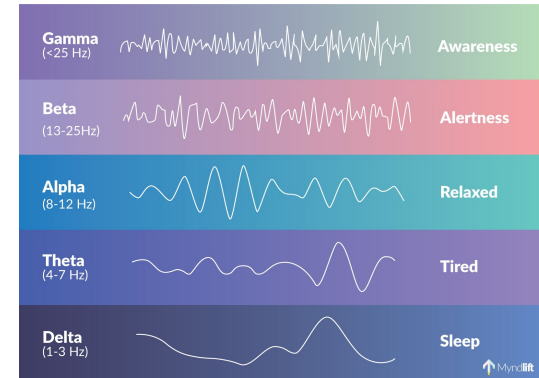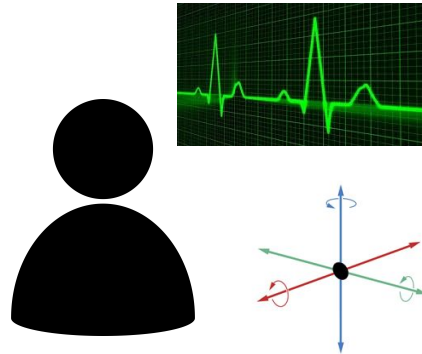
- Temperature
- Humidity levels

Environmental sensors

- Vibration
- Sound (noise)
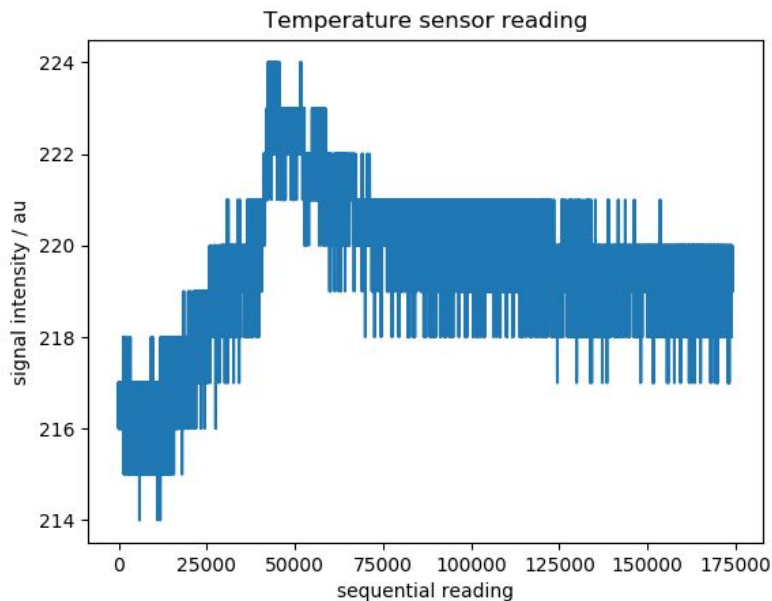- Temperature
- Air quality
- Barometer
- Light sensor

Personal **physiological** sensors

- Brain activity (Muse)
- Heart rate (Fitbit)
- Movement (accelerometer, Fitbit)

Gamma (<25 Hz)		Awareness
Beta (13-25Hz)		Alertness
Alpha (8-12 Hz)		Relaxed
Theta (4-7 Hz)		Tired
Delta (1-3 Hz)		Sleep

Myndlift

Classroom temperature sensors
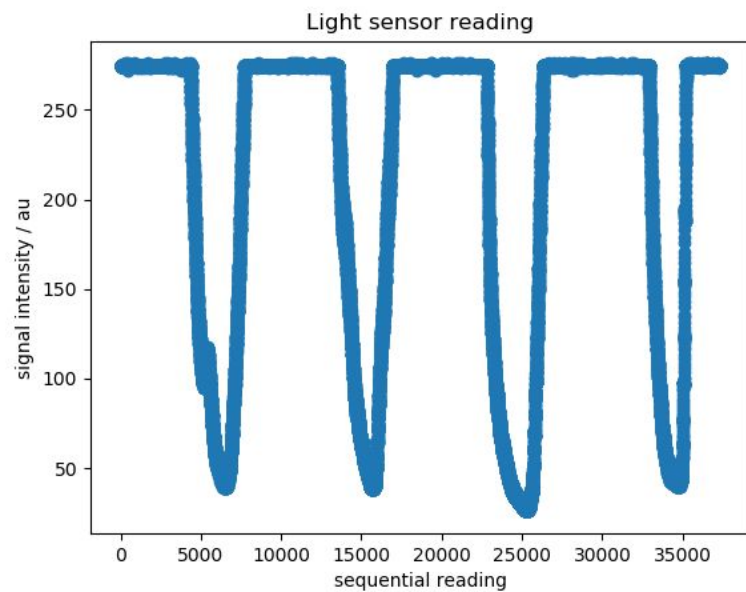
Fitbit API

https://github.com/orcasgit/python-fitbit

Applications I registered

+ Register a new app

Application OxHack
OxHack biofeedback

Edit Application Settings   Delete Application

Reset Client Secret   Revoke Client Access Tokens

OAuth 2.0 Client ID
22D69F

Client Secret
6993204829a0c8c580b48f417b6084d2

Callback URL
http://127.0.0.1:8080/

OAuth 2.0: Authorization URI
https://www.fitbit.com/oauth2/authorize

OAuth 2.0: Access/Refresh Token Request URI
https://api.fitbit.com/oauth2/token

OAuth 2.0 tutorial page
View all applications

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← → C   ⓘ 127.0.0.1:8080/?code=e4ac72ab52b93e0e12f6910dadba2b17c18278e6&state=0WU2vnaJWYL7tXxsLdCgb7qdBbtK7v#_=_
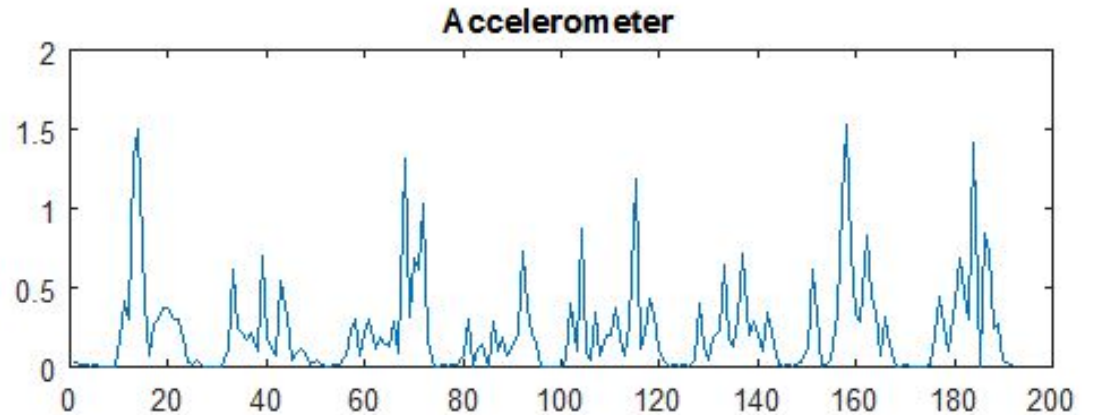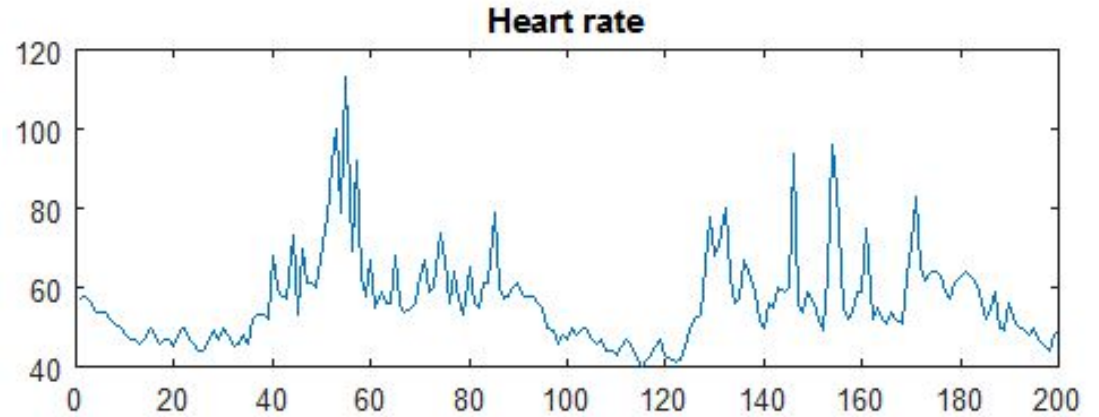
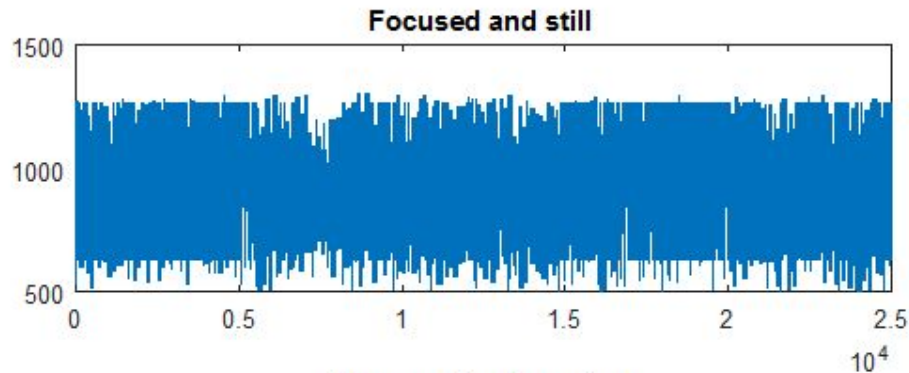# You are now authorized to access the Fitbit API!

You can close this window

Fitbit data

Average HR per lecture

Average movement per lecture

Muse headband EEG data

Focused and still

Constant variability

Distracted and moving
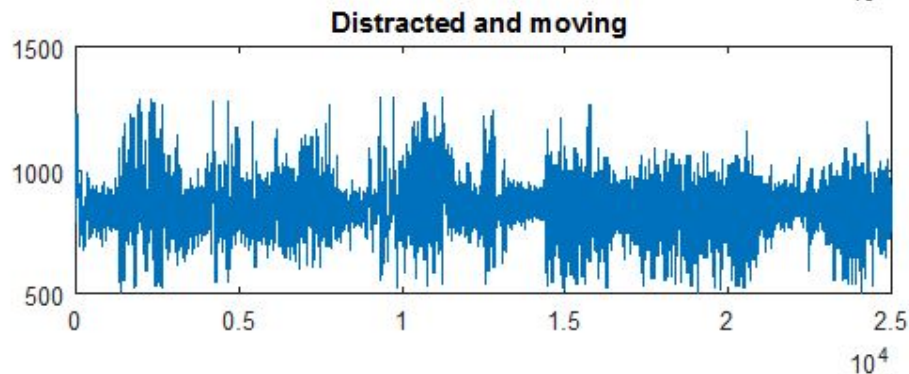
Changing variability

Acknowledgments

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