

Sviluppo di una Web App per la ricostruzione del battito cardiaco partendo dall'EEG tramite una Rete Neurale Convoluzionale

Tesi di Laurea in Ingegneria Informatica

Candidato

Lorenzo Monaci

Relatori

Prof. Antonio Luca Alfeo

Prof. Mario G.C.A. Cimino



UNIVERSITÀ DI PISA

Introduzione e Problema

IA in ambito medico

Obiettivi

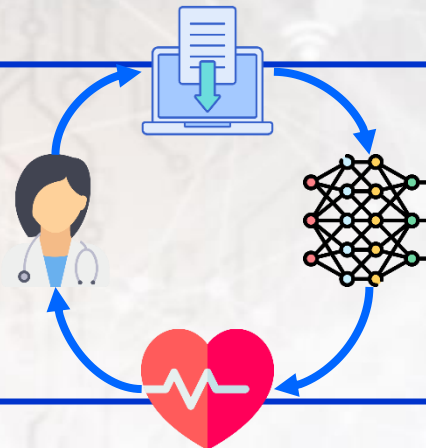
- **Affiancare il personale sanitario**
- **Riduzione tempistiche e costi degli esami**
- **Alta affidabilità**

In pratica

- 1. Estrarre più informazioni da un singolo esame**
- 2. Interazione facile e intuitiva**
- 3. Interfaccia Human-Friendly**

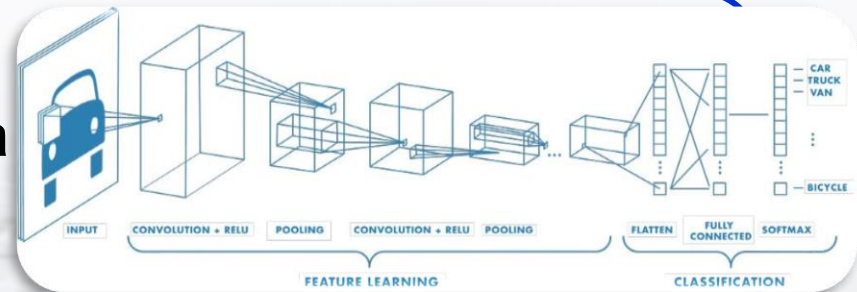
La sfida

Ricostruzione del HR dall'EEG tramite una applicazione web che si interfacci con l'utente in modo chiaro e immediato



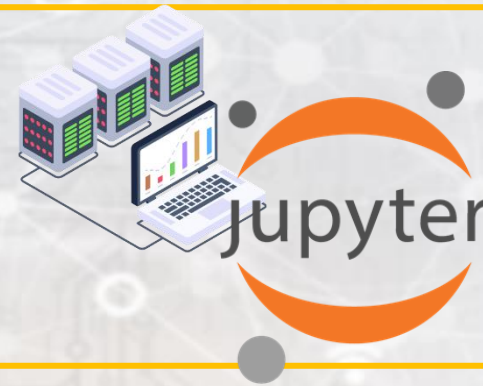
Reti Neurali Convoluzionali

Recenti studi dimostrano la loro efficacia sull'analisi dell'EEG



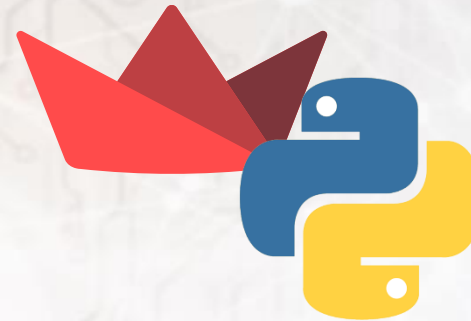
Google Colab

Svolge la funzione di server e fornisce l'hardware per le elaborazioni



Streamlit

Fornisce le API utili per lo sviluppo lato Front-End dell'applicazione



Retrieve HR from EEG using a Convolutional Neural Network

Please upload files which file name formats as follows:

subject_[i]_MADtsROLLINGrawCLASSIFICATION_[DATA/LABELS]_[wlen]_[overlap]_BK_[grps]_[series].csv

Where:

- i is the subject taken in exam
- wlen is the length of each time window
- overlap is the amount of data overlap between each time window
- grps is the number of groups in the time series
- series is the number of correlated channels

Select the time window overlap

25

Select the number of points per time window

150

Select the number of windows extracted per subject

3

Upload the EEG file for the data



Drag and drop files here

Limit 200MB per file • CSV

Browse files



subject_5_MADtsROLLINGrawCLASSIFICATION_DATA_150_25_BK_0835_23.csv

26.5MB



subject_4_MADtsROLLINGrawCLASSIFICATION_DATA_150_25_BK_0835_23.csv

26.3MB



subject_3_MADtsROLLINGrawCLASSIFICATION_DATA_150_25_BK_0835_23.csv

26.3MB



Showing page 1 of 2

Upload the labels



Drag and drop files here

Limit 200MB per file • CSV

Browse files



subject_5_MADtsROLLINGrawCLASSIFICATION_LABELS_150_25_BK_0835_23.csv

2.5KB



subject_4_MADtsROLLINGrawCLASSIFICATION_LABELS_150_25_BK_0835_23.csv

2.5KB



subject_3_MADtsROLLINGrawCLASSIFICATION_LABELS_150_25_BK_0835_23.csv

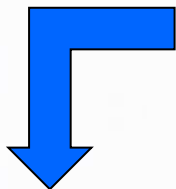
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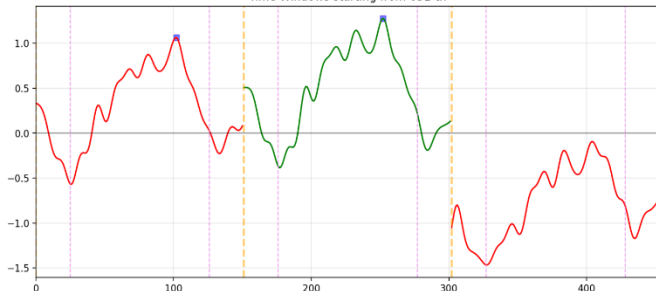
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Start computation

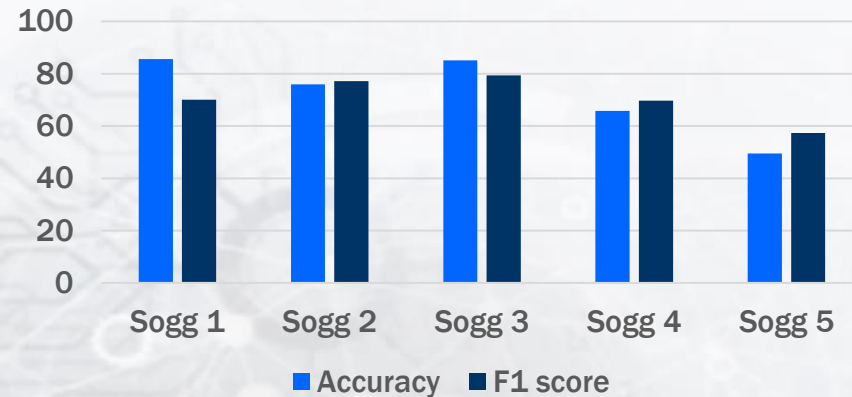
Reload



Time Windows starting from 651-th



Multisoggetto (overlap 100)



$$\mu = 72.38$$

$$\sigma = 13.53$$

$$\mu = 70.72$$

$$\sigma = 7.71$$

Monosoggetto (overlap 100)

