UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Ai Applied To Neurological Sciences and Brain-Computer Interfaces

2425-2-F551MI036

Area di apprendimento

Obiettivi formativi

The main objective of the course is to provide the students with basic understanding of neurological diseases, introducing the main clinical features, as well as their functional neurophysiological correlates.
Further aim will be to provide an introduction to the basics of Brain Computer Interfaces (BCI) principally based on oscillatory EEG activity, but also on transient EP and ERP signals. The course will introduce the main methods for acquiring and processing electrophysiological data allowing the decoding of brain activity in real time for converting it into BCI control signals.

Contenuti sintetici

Programma esteso

The students are expected to:

- Acquire basic knowledge on the major neurological disease and their clinical features
- Know the basic neural substrates of neurophysiological signals, and their alterations
- Identify the main medical applications of AI algorithms in neurological diseases
- Acquire knowledge on the available AI tools to promote early diagnosis of neurodegenerative diseases
- Explore basic principles for applications to drug discovery
- Evaluate potential applications for neuro-rehabilitative interventions

- Acquire basic knowledge of the various oscillatory and transient electrical signals of the brain
- Know which electrical marker might be more appropriate for assessing minimally conscious state, for 'mind reading', or robotic control
- Explore available techniques for EEG-based BCI applications for motor control and augmented communication.

Prerequisiti

Metodi didattici

Frontal lessons with slides and audio/video presentations.
(a) nature of teaching: dispensing and interactive
(b) type of teaching activity: lecture
(c) hours possibly delivered remotely = 20%

Modalità di verifica dell'apprendimento

Oral colloquim

Testi di riferimento

All relevant materials and slides will be uploaded on Ariel site after each lesson
AI applied to Neurological Sciences and Brain-computer Interfaces (a.a. 2024/25)
https://myariel.unimi.it/course/view.php?id=4150

Sustainable Development Goals

SALUTE E BENESSERE